

## 6 PUBLIC COMMENTS AND RESPONSE TO COMMENTS

This chapter of the Final SEIS includes copies of all public comments received in response to the Pipeline/South Pipeline Pit Expansion Project Draft SEIS. The BLM's responses to substantive comments are provided adjacent to reproduced comment letters. A total of 22 comment letters were received by the BLM. A list of comment letters and commentors follows:

<u>Letter</u>	<u>Commentor</u>
A	Nevada Division of Water Resources
B	United States Geological Survey
C	Great Basin Mine Watch
D	Western Shoshone Defense Project
E	Garawyn McGill-Loberg
F	Lander County Economic Development Authority
G	Nevada Department of Wildlife
H	Humboldt River Basin Water Authority
I	Elko County Board of Commissioners
J	Dave Mason
K	Christopher Sewall
L	Nevada State Clearinghouse
M	Nevada Department of Transportation
N	Thom Seal
O	Lang Exploration Drilling
P	Vogue Uniform and Linen Rental
Q	Elko Chamber of Commerce - Neal McQueary
R	Elko Chamber of Commerce - Mary Korpi
S	Broadbent and Associates
T	Greg Ekins
U	U.S. Environmental Protection Agency
V	Boise State University

This Page Intentionally Left Blank



## COMMENT LETTER A

## NEVADA STATE CLEARINGHOUSE

RECEIVED  
MAIL ROOMDepartment of Administration  
Budget and Planning Division  
208 East Musser Street, Room 200  
Carson City, Nevada 89701-4298  
(775) 684-0209  
Fax (775) 684-0260

RECEIVED

04 JUN -9 AM 10:39

DATE: June 7, 2004 BUREAU OF LAND MANAGEMENT  
BATTLE MOUNTAIN  
FIELD OFFICE

STATE ENGINEERS OFFICE

Governor's Office	Legislative Counsel Bureau	Conservation & Natural Resources -
Agency for Nuclear Projects	PUC	Director's Office
Energy Office	Transportation (Commuter)	State Lands
Agriculture Department	Transportation (Airspace)	Environmental Protection
Minerals Commission	Office of Traffic Safety	Forestry
UNR Bureau of Mines	UNR Library	Conservation Districts
Economic Development	UNLV Library	State Parks
Tourism	Historic Preservation	Water Resources
Fire Marshal	Emergency Management	Natural Heritage Program
Human Resources	Office of the Attorney General	Wild Horse Commission
Health Division	Washington Office	Wildlife Department - Director's Office
Indian Commission	Nevada Assoc. of Counties	Region 1 - Fallon
Colorado River Commission	Nevada League of Cities	Region 2 - Elko
Animal Damage Control	Public Safety	Region 3 - Las Vegas

Nevada SAI # E2004-204  
Project: South Pipeline Project - Cortez Gold Mines Inc.See E2004-011, 069, 101, & 162  
Send more information on this project as it becomes available.

## CLEARINGHOUSE NOTES See E2004-011, 069, 101, &amp; 162

Enclosed, for your review and comment, is a copy of the above-mentioned project. Please evaluate it with respect to its effect on your plans and programs; the importance of its contribution to state and/or local areawide goals and objectives; and its accord with any applicable laws, orders or regulations with which you are familiar.

Please submit your comments no later than July 7, 2004. Use the space below for short comments. If significant comments are avoided, please use agency letterhead and include the Nevada SAI number and comment due date for our reference. Questions? Michael Stafford, Clearinghouse Coordinator, (775) 684-0209 or [mstafford@budget.state.nv.us](mailto:mstafford@budget.state.nv.us).

## THIS SECTION TO BE COMPLETED BY REVIEW AGENCY:

- ☐ No comment on this project  
☐ Proposal supported as written  
☐ Additional information below
- ☐ Conference desired (See below)  
☐ Conditional support (See below)  
☐ Disapproval (Explain below)

## AGENCY COMMENTS:

E2004-204

- A-1  
A-2  
A-3  
A-4
- Cortez Gold Mines, Inc. (CMGI) controls water rights sufficient to operate the project as proposed. CMGI is in possession of a current permit for construction and operation of process ponds and tailings storage facilities described in the DSEIS. Should replacement of water as described in the proposed mitigation sections become necessary, separate rights to perform such water deliveries must be acquired. Should the tailings storage facility require modification to support the proposed project, a new permit for the construction and operation of the facility will be required.

*Michael J. Anderson*  
 Signature  
 MICHAEL J. ANDERSON P.E.

DWR August 5, 2004  
 Agency Date

A-1

Comment noted.

A-2

Comment noted.

A-3

CGM currently has sufficient water rights to address long-term mitigation. See text on pages 4-101 (4.3.3.3.1-4b), 4-116 (4.3.3.3.2-4b), 4-129 (4.3.3.3.3-4b), 4-141 (4.3.3.3.4-4b), 4-150 (4.3.3.4-4b), 4-159 (4.3.3.5-4b), and 4-169 (4.3.3.6-4b) for language regarding the replacement of effected water rights.

A-4

The Proposed Action does not modify the tailings facility that has been approved by the BLM. However, CGM will modify their current permit with the NDWR to complete the expansion that was addressed in the South Pipeline Final EIS (BLM 2000a). CGM is currently authorized by the BLM to expand the existing tailings facility.

## COMMENT LETTER B

Reply Refer To:  
Mail Stop 423  
BLM

July 12, 2004

## MEMORANDUM

To: Nevada Department of Wildlife  
Lander County, Nevada

From: James F. Devine (Katherine Lins */signed/* for)  
Senior Advisor for Science Applications

Subject: Review of Draft Supplemental Environmental Impact Statement for the  
Pipeline/South Pipeline Pit Expansion Project Proposed

As requested by the U.S. Department of the Interior, Office of Bureau of Land Management (BLM), in their correspondence of June 15, 2004, the U.S. Geological Survey (USGS) has reviewed the subject Draft Supplemental Environmental Impact Statement (DSEIS) and offers the following comments:

**GENERAL COMMENTS:**

- B-1 Greater attention to clarity, completeness, and consistency is warranted in many figures shown in the document. For example, the y-axis is unlabeled in figure 4.4.4 on page 4-191, NCV Distribution, nor is the figure clearly described in the text. What do the y-axis values mean? The abbreviation "NCV" is defined, but what does it mean, interpretively? The x-axis on figure 4.3.15 is labeled simply "distance;" the reader is left to figure out what reference point "0" represents and what the significance of positive and negative numbers is relative to the reference point. Most map figures use different scale bases, and many do not have basemap features to help readers get a common geographical frame of reference, for example, figure 4.4.3 on page 4-189 and figure 4.3.18 on page 4-73. These comments cite only a few examples rather than an exhaustive list, but they indicate that the report is replete with discrepancies and excessive complexity; thus, a more careful editorial review of figures is warranted. All figures in the document should be "stand alone" and self explanatory. Without clarity and completeness, the figures are nearly meaningless in providing support of findings or conclusions stated in text.
- B-2
- B-3
- B-4 The document fails to discuss the assumptions used to translate the conceptual model of the aquifer system to the numerical model, particularly in the vertical dimension. The USGS recommends that the document discuss the three-dimensional aspect of the model in detail; for example, the number of layers in the model, whether those layers are isolated or connected, in which layer(s) the water table is located, and whether the water table is drawn down below the bottom of the alluvium near the pit.

## B-1

On Figure 4.4.4 the y-axis is the number of samples. On Figure 4.3.15 the x-axis is the distance from the center of the infiltration pond. The figures have been modified to address the comment.

## B-2

The intent of maps and figures in NEPA documents is to provide information to supplement the text of the document. The preparation and format of this document meets the generally accepted NEPA standards.

## B-3

See response to Comment B-2.

## B-4

The assumptions used to translate the conceptual model of the aquifer system to the numerical model, including the vertical dimension, are fully described in Geomega (2003a), which is incorporated into the document by reference. Page 4-81 of the Draft SEIS states the following: "Details of the model including methods, hydraulic boundaries, model layers, grid layout, calibration, sensitivity analysis, and results are presented in Geomega (2003a)."

**SPECIFIC COMMENTS:****Page 4-80, Chapter 4 Affected Environment and Environmental Consequences, Section 4.3.3 Environmental Consequences and Mitigation Measures, Section 4.3.3.1 Significance Criteria:**

B-5

The choice of the 10-foot contour as the limit of concern about drawdown is arbitrary and should be justified. Any change in water level could result in a change in gradient and, hence, flow rate. Direct measurement or prediction of a flow rate in springs and streams could be a more appropriate measure.

**Page 4-93, Chapter 4 Affected Environment and Environmental Consequences, Section 4.3.3 Environmental Consequences and Mitigation Measures, first paragraph:**

B-6

The omission of any details about how the hydrolithologic units described on pages 4-30 to 4-42 are depicted as model layers makes the statements about model predictions of drawdown effects on the springs impossible to evaluate. Evidence for the assertions that the springs are indeed isolated from the main alluvial aquifer and whether the springs are affected by drawdown caused by stresses on the said aquifer should be provided. Because the proponent commits to monitoring and contingent mitigation, the accuracy of the model representation of these springs may not be critical at this time; however, the credibility of the entire model is called into question through this inconsistency. The USGS recommends that the explanation of the potential drawdown in the springs be clarified after the proposed added discussion of model vertical connectivity/layering as mentioned above.

Thank you for the opportunity to review and comment on this DSEIS.

B-5

The use of the ten-foot contour for changes to the water table as the threshold to evaluate impacts was first used by the BLM in the Betze Project EIS (BLM 1991). The ten-foot value was based on the amount of seasonal variation in the watertable in the Humboldt River Basin, which includes the Project Area. In addition, this is a supplemental EIS and the use of the ten-foot value in this document provides consistency with the previous EIS and the Pipeline EIS for the operations in the Project Area.

B-6

See response to Comment B-4. Details about how the hydrolithologic units are depicted in the model were not omitted; they are provided in Geomega (2003a).

The Draft SEIS statement on page 4-93 states that "...these springs probably originate from perched zones within alluvial fans that are recharged by flows from the Cortez Mountains" indicates that there is some uncertainty concerning the source(s) of the springs in question (in this case four of the East Valley springs). However, their occurrence on the valley floor near the toe of the alluvial fan emanating from Fourmile Canyon suggests that ground water daylights in those areas due to the local contrasts in hydraulic conductivity between the coarser alluvial fan materials and the finer grained valley fill deposits (BLM 1996a), with the driving head for the springs coming from higher up in the alluvial fan. Hence, the water supplied by flows from the Cortez Mountains is perched in the sense of being held back by the lower permeability material of the valley floor, rather than being vertically separated from the main alluvial aquifer. The ground water model explicitly represents this juxtaposition of higher conductivity alluvial units and lower conductivity valley floor deposits in the general vicinity of the East Valley springs (Geomega 2003a). Thus, there is no inconsistency between the model and the conceptual interpretation of the hydraulic system that gives rise to these springs. At the regional scale of the ground water basin, the model is designed appropriately with respect to the seeps and springs that occur in Crescent Valley.

Nevertheless, because there is still some uncertainty regarding the source(s) of the springs and in their degree of isolation from the basin fill aquifer, potential impacts were considered to be significant if the ten-foot drawdown contour encompassed or came within close proximity to the location of a spring, even in cases where it was believed that the source(s) of the springs were higher up in the mountains and would not be affected. Thus, a conservative approach was used to assess potential impacts to seeps and springs. Furthermore, CGM is committed to operational monitoring and contingent mitigation measures to be implemented if significant impacts to seeps or springs do occur (Draft SEIS, page 4-94).

## COMMENT LETTER C



*Reno headquarters:*  
505 S. Arlington Ave., # 110  
Reno, NV 89509  
775-348-1986; fax 775-337-2980  
ghenw@greatbasinminewatch.org  
www.greatbasinminewatch.org

*Las Vegas office:*  
1700 E. Desert Inn Road, # 406  
Las Vegas, Nevada 89109  
702-413-1517

Board of Directors

Glenn Miller, Ph.D. Chair

Bob Fulkerson, Treasurer

Norman Harry, Secretary

De Lalo

Aimee Boulanger

Christopher Sewall

Staff

Elyssa Rosen  
Interim Executive Director

Susan Czappek  
Political Director

Christie Whiteside  
Program Associate

Cristi Barker  
Las Vegas Organizer

August 3, 2004

Pam Jarnecke  
Project Manager  
Bureau of Land Management  
Battle Mountain Field Office  
50 Bastian Road  
Battle Mountain, Nevada 89820-1420

RECEIVED  
MAIL ROOM

2004 AUG -5 A 11:47

DM	
ADM	
PAEC	
SS	
RR	
NR	
FIRE	
IFS	
FILE LIBRARY/TOBS (CIRCLE)	

Re: Review Comments: Pipeline/South Pipeline Pit Expansion Project,  
Draft Supplemental Environmental Impact Statement (SEIS) NV063-  
EIS01-70  
Plan of Operations NVN-067575(01-1A)

Dear Ms. Jarnecke:

Thank you for this opportunity to provide comments on the subject draft SEIS. Please send a copy of the Final SEIS and the Record of Decision to us at the address above.

Great Basin Mine Watch has reviewed the environmental impact statements for both the Pipeline and South Pipeline projects. This proposed action tiers off of those two actions. Therefore, please incorporate our comments on those two projects into this one by reference.

For this review, we considered the draft SEIS and our knowledge of the previous studies. Our comments primarily concern the water resources, both quantity and quality, of the basin. Following two sections regarding the impacts on water resources, we offer some additional more general comments.

Throughout the letter, we reference passages within the SEIS and provide the appropriate page number. Any other documents are also referenced at the point of referral.

Initially, however, Section 2.10, CGM Sustainability Activities, should be removed from the SEIS because it is just an advertisement for the company. It provides no information that can be used in evaluating this project. Alternatively, because CGM pledges numerous activities for their alleged sustainability program, the BLM should include monitoring of and accountability for CGM to actually complete these activities.

Water Resources

The impacts of the proposals on water resources in Crescent Valley do not vary much except for the no backfill alternative. Because the proposed action includes partial backfill of the pit, the amount of water that will fill the pit lake under the proposed action is less than for the no backfill alternative. The partial backfill also decreases the surface area as

C-1

Your name and address are on the mailing list and you will be sent copies of the Final SEIS and ROD.

C-2

Refer to the responses to the comments in the South Pipeline Final EIS (pages 6-38 through 6-87). Great Basin Mine Watch did not submit comments on the Pipeline Draft EIS.

C-3

The commentor is correct that the text describes activities that are not part of the Proposed Action and therefore not directly evaluated in the Draft SEIS. However, the text under Section 2.10 outlines CGM's current and ongoing activities that affect the social and economic fabric of the local communities, which are of concern to both the BLM and CGM.

C-4

Comment noted. Also see the responses to Comments C-6 through C-30.

compared to no backfill, which in turn decreases the long-term evaporation by more than 50%. Complete backfill does not further decrease the evaporation by much because a pit lake will remain. From a water quantity perspective, partially backfilling the pit and recharging water into the aquifer is the most environmentally preferable alternative (if the mine is to continue.) As will be discussed in the second section, however, there are serious water quality impacts resulting from the methods of recharging the water.

- C-5 [ The SEIS presents impacts for the project as if it were to stop at different stages. This is very difficult to review because the SEIS includes similar impacts at many points. This comment letter concentrates on the impacts predicted for the proposed action being completed through stage 12 with a few comparisons made with other alternatives or stages included as appropriate.

#### Water Quantity Impacts

- C-6 [ Consumptive use estimates should be revised to include the water used to wet the unsaturated zone beneath the infiltration basins. This does not include the water in ground water mounds that have become part of the alluvial water table, but should include the water that remains bound to the soil particles after the mounds recede.

- C-7 [ Consumptive use estimates should be refined to better define usage at the Dean Ranch. It appears that the SEIS reports all water sent to the Dean Ranch is consumptively used. This is probably not correct; some of the water probably recharges the shallow groundwater near the ranch.

- C-8 [ Figure 4.3.4 shows the current (February, 2002) groundwater contours in Crescent Valley near the mine. The figure shows both the cone created by the dewatering wells at the mine in bedrock and the mounds created in alluvium near the rapid infiltration basins (RIBs). This implies the water table, or potentiometric surface, transitions smoothly from bedrock to alluvium under the stress caused by dewatering and reinfiltration. The following passage from the SEIS, however, suggests that may not be correct.

Detailed studies at other mining areas in north-central Nevada have shown that ground water flow in bedrock of the mountain ranges is typically restricted to individual hydrologic domains or compartments, which are separated by low-permeability barriers along faults, intrusions, and mineralized zones (Maurer et al. 1996). Hence, ground water levels and movement can vary greatly within the siliceous bedrock of the mountain ranges. SEIS, page 4-32.

This suggests that dewatering bedrock, which lowers the water table below the upper extent of the bedrock, may disconnect the saturated zones between the bedrock and alluvial aquifers. In other words, there may be a zone of unsaturated bedrock (or even alluvium) between the ambient and mounded groundwater at the RIB sites and the underlying bedrock. The following passage indicate the presence of perched water zones.

C-5

Comment noted.

C-6

Prior to infiltration, the soil moisture distribution in the unsaturated zone beneath the future infiltration sites was in a state of dynamic equilibrium. Moisture profiles at that time reflected the balance between gravity and capillary suction forces in the soil. Soil moisture ranged from dry in near surface and coarser grained soils to wet in deeper layers and finer grained soils (Westec 1997b; GeoSystems Analysis 1999). Upon cessation of infiltration operations, gravity drainage will occur and the infiltration mounds will dissipate, leading to unsaturated conditions above the water table. Eventually, suction will balance the force of gravity and the soil moisture profile will again reflect a state of dynamic equilibrium. Since pore water remains mobile even at extremely low moisture contents (Stephens 1996), and assuming that other parameters (e.g., climatic conditions, soil hydraulic properties, depth to the water table) remain the same, the soil water will seek approximately the same dynamic moisture equilibrium as existed prior to infiltration. The reestablishment of equilibrium conditions will occur gradually over time as the water used to wet the soil underneath the infiltration sites drains into the aquifer. Since essentially all of the water used to wet the unsaturated zone beneath the infiltration sites will eventually return to the aquifer, it is not considered to be consumptively used.

C-7

It is possible that a small amount of the irrigation water applied at the Dean Ranch could become ground water recharge. In a recent study by the USGS (Stonestrom et al. 2003), chloride mass balance calculations indicated that between eight percent and 16 percent of the water applied as irrigation to crops eventually recharged the aquifer at a similar site in southern Nevada. However, the Draft SEIS assumption of total consumptive use of the water delivered for irrigation is conservative in terms of predicting potential water quantity impacts because it corresponds to a slightly greater net amount of water removal from the ground water system than probably actually occurs.

The Dean Ranch is a legally permitted agricultural facility. Irrigation operations there are regulated by the state and are conducted in a manner that is typical of many other irrigation operations in Nevada. State regulated components of the Dean Ranch operation include regular monitoring and reporting of water usage, ground water levels, and water quality in the vicinity of the ranch.

C-8

The quoted passage from page 4-32 of the Draft SEIS occurs in a discussion of the siliceous (Western Assemblage) bedrock hydrolithologic unit, and describes generalized conditions of ground water flow in mountain blocks of the Shoshone Range northwest of the open pit. The passage does not apply to the hydraulic interaction(s) between overlying alluvium and the carbonate (Eastern Assemblage) bedrock hydrolithologic unit that comprises the Gold Acres Window.

Water level observations and numerical modeling both show that, in most places, there is a strong hydraulic connection between alluvium and bedrock of the Gold Acres window in the general vicinity of the Pipeline/South Pipeline open pit. The fact that mine dewatering has successfully drained the alluvium overlying and surrounding the open pit even though the production wells are pumping entirely from the underlying carbonate bedrock is evidence that these units are well connected in this particular region. In some localized areas, such as at monitoring well SH-05A in the southwest corner of the Gold Acres window, water levels have responded more slowly to dewatering due to the presence of discontinuous lower-permeability horizons within the alluvium. However, the hydraulic response, even though reduced and/or delayed in those areas, unquestionably proves that the bedrock and alluvial aquifers are in hydraulic communication.

The comment confuses the concepts of depressurization and desaturation. The fact that hydraulic heads in bedrock are lower than those in the overlying alluvium in certain areas does not necessarily mean that saturated zones in bedrock and alluvium are disconnected (i.e., that there is an intervening unsaturated zone), as suggested in the comment. Rather, it indicates that ground water flow is directed vertically downward from the alluvium into the depressurized bedrock, where it is then transmitted laterally to the points of extraction at the pumping wells.

Since monitoring data and the numerical modeling both show that a strong hydraulic connection exists between alluvium and bedrock of the Gold Acres Window, and because there are no indications of a disconnect between saturated zones in the alluvial and bedrock units, it is appropriate to represent the water table as transitioning smoothly from bedrock to alluvium in the general vicinity of the Pipeline/South Pipeline open pit. Hence, the ground water contours shown on Figure 4.3.4 correctly depict the effects of the hydraulic connection between alluvium and bedrock hydrolithologic units in the open pit area. In recognition of the fact that there are slight vertical differences in hydraulic head, the word "generalized" has been added to the title of Figure 4.3.4.

C-9

Figures 4.3.20, 4.3.21, 4.3.26, and 4.2.27 have been corrected in the Final SEIS.

Although much of the alluvium overlying the Crossroads pit area appears to be effectively desaturated, there are some areas near the edges of the Gold Acres window where the alluvium is still partially saturated. For example, in the southwest corner of the Gold Acres window at monitoring well SH-05A, saturated alluvium is present near pre-dewatering ambient levels (water levels are approximately 90 to 150 feet below ground surface). The nearby bedrock monitoring well SH-04B indicates that hydraulic head in the bedrock aquifer is over 530 feet lower than in the overlying alluvial aquifer in that area. Thus, perched water appears to exist in that portion of the Gold Acres window, while the underlying bedrock has been significantly depressurized. Similarly, perched ground water conditions are present to the northeast of the Gold Acres window near alluvial monitoring well SMA-15. These water-level differences suggest that at least some of the bedrock structures within and bounding the Gold Acres window have analogous expressions in the basin-fill aquifer, which locally have a strong influence on lateral ground water flow. SEIS, page 4-45.

It appears the person who developed Figure 4.3.4 did so assuming that there is a connection between the two layers, which in fact are probably two distinct aquifers.

C-9

Figures 4.3.20 – 22 and 26 – 28 are incorrectly labeled. These show that drawdown exceeds 880 feet at the mine. Clearly, this represents dewatering in bedrock, not just basin fill as the labels suggest. The text that refers to the figures also mentions bedrock.

The fact of groundwater flow being limited to specific units also applies to the question of what caused the Cortez pit lake to dry. The SEIS reports that a 60-foot deep lake in the Cortez pit seeped away between 1997 and 1999; it also reports that bedrock water levels have dropped 140 feet during the same period (SEIS, page 4-31). This period was not a drought and in fact contains one of the wetter months on record (for example, May 1998). Figure 4.2.1 show that some bedrock formations outcrop on each side of the valley (that this map does not provide a project outline renders the task of determining which outcrop is near the mines more difficult). One formation on each side of the valley is the Valmy formation. Figure 4.2.5 does not show faults that extend across the valley but Figure 4.2.3 shows that depth to bedrock is great, especially northeast of a line connecting Pipeline with Cortez.

C-10

The following passage also indicates that the bedrock structure near Pipeline and Cortez may be connected. It also indicates that current faults may once have been connected, and it therefore must be concluded that the connection could still exist.

The subsurface geology of the Gold Acres and Cortez windows is shown in Figure 4.2.4. Figure 4.2.5 shows the known and inferred structures within the Gold Acres window. A reconstruction model of Crescent Valley prior to Basin and Range extension and formation of the Cortez rift suggests that the Gold Acres and Cortez windows were once united (McCormack and Hays 1996). Reconstruction of the Basin and Range extension suggests that the Pipeline fault is associated with the Cortez fault and may have been the same structure. Also,



the Gold Acres and Mill Creek stocks are shown to have originated as the same intrusive body, separated by the right-lateral offset of the Pipeline-Cortez fault during the Cortez rifting event. SEIS, page 4-9.

These facts clearly suggest that dewatering at Pipeline could have dried the Cortez pit lake. It is essential that the BLM determine the cause of the lowering water levels in the Cortez Mountains. If related to the dewatering, as the evidence suggests, the groundwater modeling, which does not yet show impacts now or in the future to water levels in the Cortez Mountains, is wrong. **If the modeling is wrong, most of the predictions in the EIS are also wrong.**

C-11

That the groundwater model has been calibrated appropriately to existing water level data does not somehow show that effects it misses in the Cortez Mountains are not really associated with the dewatering. Calibration sets hydrologic parameters for the model as conceptualized. The modeler assumed that effects in the Cortez Mountains are outside the model domain. Thus, there is no chance that the model will predict impacts in the Cortez Mountains. If the 140 foot water level drop in the Cortez Mountain bedrock was added to the model domain and calibrated for, then the future effects may be more properly predicted.

C-12

Table 4.3.1 presents a water budget for the valley that mixes components of the valley-wide water budget with a groundwater specific water budget. It appears the intent of the discussion is to present a groundwater budget. A proper groundwater budget would show the recharge within the basin, not the precipitation to the valley. It would only show ET from the groundwater (the bottom line in the table). The numbers presented for precipitation and ET completely overwhelm the other budget factors. It is not appropriate to show dewatering or reinfiltration in a basinwide model? water; only the consumptive use of the dewatering water should be shown as a discharge from the basin. Showing the dewatering pumpage and reinfiltration is appropriate if the budget is for the groundwater. This table should be redone to show recharge, natural ET, consumptive use from mining and non-mining activities, inflow at Rocky Pass and outflow to the Humboldt River for just the groundwater basin.

Table 4.3.1 should also be consistent with its estimates. For example, the recharge estimate is that based on methods similar to the Maxey-Eakin method while the ET estimate was derived from the groundwater model. The SEIS presents ET estimates elsewhere; these should be used for consistency.

The SEIS presents water budget information with significant potential, unexplained errors. It cites a USGS study showing that evapotranspiration varies from 19,600 to 37,100 af/y (SEIS, page 4-76).

C-13

The BLM's threshold for impacts to springs, seeps and streams is grossly too high and technically wrong. As a description of this threshold, the BLM states the following: "Predicted impacts are considered to be significant where the modeled ten-foot ground water drawdown contour encompasses a spring, seep, or stream and where the surface

C-10

CGM and the BLM have considered the possible cause(s) of ground water drawdown in the Cortez window since it was first noted in 1997. Previous work on this subject is documented in several reports cited in the Draft SEIS (Brown and Caldwell 1998, 1999; Geomega 2001c, 2002e), and ground water conditions in the Cortez window continue to be evaluated annually (e.g., Geomega 2003d). The possibility that Pipeline dewatering operations could be related to the observed water level declines in the Cortez Window is one of several possible mechanisms that have been investigated. However, a definitive hydraulic connection between the Cortez and Gold Acres windows has not been established. CGM's ongoing study of ground water behavior in the Cortez window, in cooperation with the BLM, is evidence that a serious effort is being made to understand the cause(s) of the drawdown.

The comment asserts that if the cause(s) and effects of drawdown in the Cortez window are not reflected in the model, then the model is "wrong" and, hence, so are many of the model's predictions. Such an assertion fails to consider the effects of hydraulic barriers to ground water flow between the Cortez window and the basin fill aquifer, and it overdramatizes the potential effects of the model's representation of bedrock areas outside of the Gold Acres window.

Declining water levels in the Cortez window are limited to a small region in the immediate vicinity of the Cortez open pit (Geomega 2003d), and are not expected to perceptibly impact the basin fill aquifer due to the strong hydraulic boundaries that effectively isolate the area of drawdown, as evidenced by monitoring data from wells and springs within and surrounding the Cortez window. (In fact, the ground water model included several of the monitoring wells completed in the basin fill aquifer adjacent to the Cortez window, which do not show drawdown, as calibration targets, and successfully matched those observed conditions.) Thus, there is no need to simulate the very localized water level declines within the Cortez window for the purposes of this SEIS because they would have a negligible effect on the assessment of potential impacts to the basin fill aquifer.

As a matter of practicality, the ground water model does not represent detailed aspects of the complex flow conditions in bedrock outside of the Gold Acres Window and the SEIS predictions are focused on the basin fill aquifer as follows: The amount and extent of drawdown are presented in this SEIS only for the alluvial aquifer because that is the primary aquifer of use and extent in Crescent Valley. Also, the complex fault-block-controlled nature of ground water flow in the mountain ranges causes greater uncertainty in drawdown predictions for those areas, compared with the relatively more continuous alluvial aquifer system. For

these reasons, drawdown contours are only shown to the limit of the alluvial aquifer, and no drawdown contours are shown for the bedrock aquifer (Draft SEIS, page 4-97).

It is understood that the ground water flow model cannot reasonably include all of the complex structural features within the mountain ranges, even if adequate information describing those features were available; thus, the model is only expected to provide a coarse representation of actual conditions in bedrock in the mountains. Importantly, it was previously determined that similar modeling assumptions (i.e., detailed flow behavior in bedrock areas outside of the Gold Acres Window can be neglected and model predictions should focus on the basin fill aquifer because it is the primary aquifer in Crescent Valley) were reasonable and appropriate for evaluating potential impacts of the Pipeline and South Pipeline Projects under NEPA (BLM 1996a, 2000a) and no comment was made on these assumptions during public scoping for the current SEIS. Nevertheless, the model's predictions regarding the basin fill aquifer are still valid because the basin fill aquifer is not influenced to an appreciable degree by localized, discontinuous ground water fluctuations in individual bedrock mountain blocks.

It is misleading to suggest that the model is "wrong" simply because it does not include every aspect and small-scale feature of Crescent Valley. As with any modeling exercise, certain assumptions and compromises must be made to render the problem tractable. In this particular case, all of the major features of the ground water flow system within Crescent Valley are included in the model, and the intentional disregard of features that are limited to small-scale isolated areas of bedrock does not render the model's predictions inaccurate for the basin fill aquifer. Detailed knowledge of localized ground water behavior in the Cortez Mountains is not required to form valid predictions regarding potential impacts to the basin fill aquifer.

C-11

See response to Comment C-10.

C-12

Table 4.3.1 presents the estimated average annual water budget for Crescent Valley in 2001. The table was not intended to be specific to ground water, although all of the information necessary to understand the basin's ground water budget is provided in the table. More detailed breakdowns and calculations of the various water budget components are provided in Geomega (2002b, Tables 4-1 through 4-4; 2003a, Tables 3-2 and 3-3). For example, ground water recharge is simply the difference between precipitation (432,000 acre-feet/year) and evapotranspiration of precipitation and soil moisture (413,000 acre-feet/year), which amounts to 19,000 acre-feet/year. Since the numbers are presented in tabular form instead of graphically, the magnitude of the precipitation and evapotranspiration values do not "overwhelm the other budget factors" in any limiting way. The concept of what constitutes a "proper" ground water budget and the appropriateness of showing dewatering and reinfiltration in a basin-wide model are open to interpretation. The table does not need to be redone because all of the requested components (recharge, natural evapotranspiration, consumptive use from mining and non-mining activities, inflow at Rocky Pass and outflow to the Humboldt River) are either already explicitly provided in the table or are easily calculated from the given information.



The commentor suggests that similar methods should be used to derive the numbers presented on Table 4.3.1; however, in most cases water budget components are not estimated by similar methods because the best method for estimating a certain component (say recharge) is often not the best method or may not be appropriate for estimating another component (e.g., evapotranspiration). If the commentor seeks to know how the water budget components estimated by the model (a single method) compare to those estimated from various sources and methods, then she/he is referred to Geomega (2003e, Tables 4-3 and 4-7), where comparisons are made under different stress conditions at different points in time.

The commentor also suggests that the ground water evapotranspiration value listed on Table 4.3.1 is inconsistent with information presented elsewhere in the Draft SEIS. The discussion of estimated average annual evapotranspiration rates occurs on pages 4-75 to 4-76 of the Draft SEIS. In that discussion, it was concluded that a plausible range of "steady-state" annual evapotranspiration values for Crescent Valley was 14,100 to 14,700 acre-feet/year. This range was thought to be a reasonable representation of conditions prior to the onset of Pipeline Mine dewatering in 1996 and was used in the calibration of the steady-state ground water flow model (Geomega 2003a, Table 4-3). The value of ground water evapotranspiration shown on Table 4.3.1 (15,100 acre-feet/year) corresponds to conditions in 2001, as simulated with the calibrated ground water flow model (Geomega 2003e, Table 4-7). Given that the ground water flow system of Crescent Valley was not in equilibrium in 2001, it is expected that the rate of ground water evapotranspiration at that time would be slightly different than the rate estimated for "steady-state" conditions. Thus, Table 4.3.1 and the Draft SEIS are consistent regarding the matter of estimated average annual evapotranspiration rates.

Contrary to the comment, the Draft SEIS does not present water budget information with "significant potential, unexplained errors." The cited study by the U.S. Geological Survey (Berger 2000), showing that estimated evapotranspiration within Crescent Valley varies from 19,600 to 37,100 acre-feet/year, actually lists those values for two different points in time; 1989 and 1995, respectively. The difference between the two estimated values is not due to unexplained errors; rather, it is attributed to changes in observed plant densities over the intervening six years, as explained in the Draft SEIS (page 4-75).

#### C-13

The discharge rate of a spring hydraulically connected to a water table aquifer depends upon the difference between the head in the aquifer in the vicinity of the spring and the elevation of the spring's discharge point. In general, the aquifer head in the vicinity of a spring is variable, but it must be greater than the spring's discharge elevation for flow to occur. Thus, a spring can be modeled as a fixed head boundary only as long as the aquifer heads in the vicinity of the spring are above the spring's outlet elevation. If heads in the aquifer drop below the spring elevation, the spring dries up and it ceases to act as a boundary of the flow domain (Bear 1979).

water feature is hydraulically connected to the aquifer affected by drawdown." (SEIS, page 4-81). If the surface water feature is hydraulically connected to the aquifer, by definition, its head equals the head in the aquifer. If the modeling includes such a feature as a boundary, it would be modeled as a boundary at that point and the head would be held constant. Since most springs are not modeled as boundaries, the head in the springs will not hold the modeled head constant. But, any seep or spring emanating from a water table will be affected by **any change** in the head unless it depends on perched water. Thus, the proper way to handle this threshold is as follows. Streams and perennial springs and seeps that are connected to the regional water table should be modeled as boundaries (the RIVER module or the DRAIN module in MODFLOW) so that the decrease in flow can be estimated. The threshold for potential impacts to other springs, seeps, ephemeral streams and wells should be 5 feet. This recommendation would also be conservative to the resource because of the huge uncertainty in the prediction.

C-14

Mitigation measure 4.3.3.3.1-2b calls for the development of a well next to a spring that ceases to flow due to dewatering drawdown. Please explain how installing a well, which by definition will remove water from the local storage in the aquifer, will allow the spring to ever recover.

The proposed action and alternatives (except complete backfill) will result in more than 1000 af/y of evaporation forever. This is an exceptional waste of water in a desert. Cortez must have water rights for this loss. The following passage suggests that Cortez may retire water rights to offset the evaporative loss

The Crescent Valley Hydrographic Area is classified as a designated basin by the Nevada State Engineer and the withdrawal and use of ground water is regulated. Evaporative losses may be treated as a consumptive use and accounted as a water right at the discretion of the Nevada State Engineer. The resulting annual volume of water is comparable to the annual water use allowed for a land parcel of equivalent area placed under irrigation. Since CGM holds senior certificated water rights for both agricultural and mining/milling uses in Crescent Valley, replacement of evaporative pit lake loss with a certificated water right would result in no net gain in permitted ground water withdrawal or consumptive use from Crescent Valley. The transfer of these water rights to offset the evaporative losses from the pit lake would render the impacts on water rights insignificant. SEIS, page 4-97

C-15

Does Cortez plan to use its water rights for this evaporative loss? It is taking an action now that requires a water rights transfer; the State Engineer should not be faced with a filling pit lake when asked to transfer the water rights. The SEIS acknowledges that "the long-term consumptive use of water resources that do not contribute to beneficial use is considered to be a significant impact for which there are no mitigation measures that appear to be feasible." (SEIS, page 4-116). It is not legal to permit a water right transfer to a use that is not beneficial. Please provide more discussion about this. Please address

The "proper way" to model seeps and springs is open to interpretation, and partly depends upon the amount and consistency of flow from the spring in relation to the scale of the model. Seeps and springs with very low or zero discharge in a regional model can have little or no significance on the ground water balance, and thus may be neglected (Bear 1979; Anderson and Woessner 1992). Similarly, if a seep or spring emanates from a small, isolated mountain block that is not connected to the water table aquifer, it will have no effect on the ground water balance of the flow domain. Many of the monitored seeps and springs in the southern part of Crescent Valley, including those in the East Valley group, typically have flows of less than five gallons per minute (less than eight acre-feet/year) and are frequently dry. Hence, in context of the regional ground water flow model's steady-state water budget (in/outflow at approximately 19,000 acre-feet/year), it is reasonable to neglect the discharge from these springs and not include them as boundaries of the model.

Also see the responses to Comments B-5 and B-6.

C-14

The wells mentioned in Mitigation Measure 4.3.3.3.1-2b would be pumped at appropriate rates "to restore the historical yield of the spring." Since the potentially impacted springs in the East Valley Group have generally yielded less than five gallons per minute of flow, any corresponding drawdown from the mitigation well(s) would be very small. After the time of maximum drawdown extent has passed, natural replenishment of aquifer storage will cause the regional water table to rebound. Eventually, the rising water levels will overcome the negligible drawdown of the mitigation well(s), and the flow of the spring will recover.

C-15

The quote attributed to page 4-116 is actually on page 4-115.

Retirement of water rights or acquiring the appropriate permits to offset evaporative losses from pit lakes can be done with the approval of the Nevada State Engineer. This would not need to occur until the actual evaporative loss begins to occur. The Nevada State Engineer has stated that CGM has sufficient water rights to operate the Project as proposed. See Comment A-1.

how this evaporative loss in perpetuity is in the public interest as required by Nevada water law.

C-16

The BLM concluded that subsidence, which may be as much as 2 feet up to 4 miles southeast of the mine, will not significantly affect the aquifer properties in the region (SEIS, 4-103, 104). The BLM must remember that an aquifer is a water bearing formation that is sufficiently permeable to allow the transmission of water in usable quantities. Decreases in that permeability render an aquifer less usable. The BLM did not adequately document its conclusion that subsidence would not affect the aquifer in the SEIS. The fact that the BLM considers the fissures that form due to the subsidence to be significant (SEIS, page 4-104, 105) further raises questions about changing aquifer properties. The final SEIS should include predictions for the changes in hydraulic conductivity so that the reader can assess whether these effects are significant.

C-17

As stated above, the BLM concluded that the fissures could be significant, but the mitigation plans are inappropriate and may exacerbate the situation. As stated (SEIS, page 4-105) a fissure provides a preferential flow pathway, a shortcut for contaminants to reach the groundwater. But mitigation measure 4.3.3.3.1-7a is that fissures "shall be filled in with clean, coarse-grained alluvium in accordance with the fissure monitoring plan. The intent of using coarse-grained (permeable) backfill is to provide a rapid means of dissipation for any surface water entering the fissure." (SEIS, page 4-105). Rather than dissipating the water, filling the fissures with gravel will prevent the water from running off, potentially capturing water to drain into the fissure. In essence, the design would create a type of French drain. Mitigation measure 4.3.3.3.1-7a will actually enhance the movement of contaminants to the groundwater.

Additionally, a gravel bed may filter the sediments that would ultimately close the fissure. Thus, flow into the fissure may occur for a much longer time period.

C-18

The BLM must also analyze the potential for the fissures near the pit to cause a slide of the pit walls into the pit. This could occur after the pit lake begins to form and groundwater levels being to approach pre-mining levels; water in the fissures could exert pressure that causes further slippage along the fissure line.

#### Water Quality

C-19

The discussion in the SEIS regarding water quality at the infiltration basins is completely wrong and misleading. The monitoring data shows substantial groundwater degradation due to both the leaching of TDS and nitrates. The SEIS fails to discuss this and states:

Despite similar chemistries in the background alluvial ground water and the water produced by open pit dewatering (Geomega 2002a), the ground water near each of the infiltration sites (Highway, Filippini, Rocky Pass, Frome, and Windmill) initially showed increased concentrations of TDS and constituent analytes followed by a **gradual decline to background conditions** (Geomega 2002a). This trend is due to the dissolution of naturally occurring minerals, such as

C-16

Contrary to the comment, the BLM did not conclude in the Draft SEIS that subsidence would not affect the aquifer. Instead, it was stated as follows: "A small change in aquifer characteristics is expected to result from compaction of the aquifer materials... the subsidence would result primarily from a permanent reduction in porosity in the finer grained sediments (clays and silty clays), which are not the primary water-bearing materials in the alluvial aquifer." (Draft SEIS, page 4-103).

The conclusion that this would not significantly affect the potential for the aquifer to transmit or store water (Impact 4.3.3.3.1-6) was based, in part, on conservative modeling results (Geomega 2003a), which were cited and described on pages 4-102 and 4-103 of the Draft SEIS. The modeling results showed that, for the entire Proposed Action, only about one percent of the volume of water stored in the upper 100 feet of saturated basin fill deposits within Crescent Valley would be removed from storage, primarily in finer grained sediments, by the end of mining in 2013.

The comment suggests that there is a potential for earth fissures to change aquifer properties. However, in reality, the earth fissures that have been observed in Crescent Valley typically occur in the shallow soil profile (above the water table), have very small apertures (less than one inch), and collectively occupy only a very small area in relation to the total aerial extent of the aquifer (Amec 2003). Thus, they would not be expected to appreciably affect the basin fill aquifer's hydraulic properties.

C-17

Mitigation measure 4.3.3.3.1-7a is designed to work in conjunction with the existing surface drainage control measures that have been implemented by CGM. The intent of the mitigation measure is to minimize development and surface migration of the fissure gullies.

There are two important factors in the development of appropriate defensive measures for earth fissures. The first is to recognize the process as one that is dynamic with the initial formation of fissures potentially being the result of deformation along each earth discontinuity. The second is the recognition that the greatest risk from earth fissures is the potential for serious earth fissure erosion not the formation of enhanced contaminant pathways. Serious erosion has the potential to compromise the primary containment systems. First and foremost, the defensive strategy must be to prevent serious erosion. With these systems intact, the source of contaminants is removed from the pathway equation. As a result, the earth fissures capture only a limited amount of surface runoff from the immediate vicinity of the fissure that is not captured by the surface runoff diversion structures.

In order to prevent the re-formation of an earth fissure at the surface, cohesionless earthen materials must be employed. If clay-rich, low permeability soils were used, the fissure could easily reform at the surface once more horizontal ground displacement is experienced. This is the reason why gravels are employed to backfill earth fissures. It should also be recognized that the principal Windmill earth fissure field is protected by a geomembrane liner, placed in a corridor that houses the dewatering pipelines. This liner minimizes any capture of either dewatering water lost through a line breach, or surface water runoff from entering the fissures. Both the dewatering water and the runoff are not contaminant sources. Systems such as the vertical intercept are capped with a blanket of low-permeability materials. This capping system is employed to minimize infiltration, and should encourage sealing once ground deformation ceases.

#### C-18

Open pit slope failures are generally controlled by one or more of the following four parameters: the stress conditions in the open pit slopes, including the effects of ground water; the geological structure, in particular the presence of large scale features; the pit geometry; and the rock mass strength. Failure modes in rock slopes are of a wide variety. The most common slope failure appears to be rotational shear failure. Rotational shear failure in a large scale slope involves failure both along pre-existing discontinuities and through intact rock bridges, but where the overall failure surface follows a curved path. Should fissures occur in an area that would be mined, the fissure planes would have similar properties to the preexisting structural fabric of the rock in the open pit slopes. In addition, the geometry of the fissure planes would not promote a rotational shear failure.

#### C-19

The Proposed Action does not include any modifications to the ongoing dewatering water infiltration activities. Potential impacts from the infiltration activities were addressed in the Pipeline Infiltration Project EA. Please refer to Section 4.1.2.2 of the EA (pages 4-1 through 4-9) for a discussion on the potential impacts. Since the Proposed Action does not modify the permitted infiltration operations, the SEIS does not provide an exhaustive discussion of the infiltration basins operations; however, the SEIS does provide a concise discussion of the infiltration basins operating conditions on pages 4-179 and 4-183 of the Draft SEIS.

calcite, magnesite, gypsum, and halite in the saline alluvial soil beneath the infiltration sites. (SEIS, page 4-181, *emphasis added*)

Great Basin Mine Watch commissioned a study of this degradation and presents it as part of this comment set. (See attached). The report, along with a complaint and request for investigation, was filed with the Nevada Division of Environmental Protection on July 13, 2004. The results of the study did not show a "gradual decline to background conditions". Rather, the data indicates that the degradation continues at Rocky Pass, Frome, Windmill I, II, and V, and includes no indication that concentrations will soon recover to standards or background. The Highway site does not show substantial problems. The Filipini site, which is no longer used, continues to have very high concentrations. In addition to salts, nitrates have recently been shown to be degrading the ground water at some of the sites. For TDS, 393 observations exceeded 1000 mg/l - 84 were between 2000 and 5000, and 36 were between 5000 and 10,000 mg/l. Five of the observations exceeded 10000 mg/l. For nitrate, 310 observations exceeded 10 mg/l, 87 of the observations exceeded 100 mg/l, and 5 of them exceeded 250 mg/l. Tables in the report document these exceedances.

At a variety of the sites, as explained in the attached complaint and report, the exceedances violate state drinking water standards for nitrates and salts by 4-6 times. These ongoing exceedances of state water quality standards constitute illegal degradation of groundwater under Nevada law. BLM's regulations plainly provide that all mining operations "shall comply with applicable Federal and State water quality standards." 43 CFR § 3809.420(b)(5). Further, under BLM regulations the "fail[ure] to comply with . . . Federal and state laws related to environmental protection" is considered "unnecessary or undue degradation," which pursuant to the Federal Land Policy and Management Act (FLPMA), 43 U.S.C. § 1732(b), the BLM is required to prevent. 43 CFR §§ 3809.5 and 3809.411. Failure to prevent unnecessary or undue degradation mandates rejection of a mining plan of operations. "If there is unnecessary or undue degradation, it must be mitigated. If unnecessary or undue degradation cannot be prevented by mitigating measures, BLM is required to deny approval of the plan. 43 CFR 3809.0-3." Kendall's Concerned Area Residents, 129 IBLA 130 (1994). Here, BLM has failed in the DEIS to address these ongoing violations of state law.

The SEIS indicates that continued discharge to the basins is not a significant impact of the proposed action because the discharge will be just a continuation of previously approved activities and because the degradation is temporary. "Temporary increases in solute concentrations that result from dewatering system discharge to the alluvial aquifer through infiltration basins have been demonstrated to be short lived and insignificant in terms of long-term water quality at the Project Area (Geomega 1998b; MLM 1999), and will not be evaluated further in this document." (SEIS, page 4-187). To the contrary, the continued use of the RIBs will lead to the continued leaching of salts and nitrates into the groundwater. It is therefore essential that the BLM conduct and present in the SEIS a complete fate and transport analysis of the leaching of both salt and nitrate. The analysis must include an estimate of the total load leached and maps of the current and the final extent of both the TDS and nitrate plume.

## C-20

See response to Comment C-19. The current permitted infiltration system has been fully reviewed and approved by NDEP (Pipeline Project Water Pollution Control Permit NEV93109 approved on March 5, 1996 and renewed on August 27, 2001) and thus complies fully with applicable state water quality requirements. Therefore this is not a violation of state law nor an unnecessary or undue impact. Moreover, at the point of discharge, water from the dewatering systems meets all drinking water standards. Leaching of solutes from the previously unsaturated zone results in a transient increase in TDS, chloride, and sulfate concentrations. The transient increase does not have the potential to degrade waters of the state due to its temporary nature and localized extent.

When considering the effects of ground water recharge (artificial or natural) on ground water quality, it is important to recognize that introduction of water into an aquifer is necessarily accompanied by the introduction of solutes, including solutes present in the recharge water and solutes mobilized by the interaction between recharge water and the aquifer matrix. Any introduction of water into an aquifer via natural recharge, surface infiltration, injection, agricultural irrigation, septic fields, etc. will modify aquifer chemistry at the point of discharge. Similarly, installation, development, and production from ground water wells for consumptive use also results in at least a temporary modification of local ground water quality, often referred to as "well shock." In the arid environment of Crescent Valley, the addition of solutes is counteracted to some degree by the removal of solutes through evaporative losses from the aquifer; the process that creates evaporite salts in unsaturated zone soils. Therefore, under any water management and recharge scenario there will be areas of recharge where solute concentrations differ from other areas where there is less recharge.

The interpretation of "temporary degradation of ground water" applied to infiltration activities should necessarily be applied to any other form of recharge that modifies ground water quality in the recharge area, when compared to the aquifer in general. Such activities include non-mining related effects from crop irrigation, domestic septic fields, and possibly natural recharge through the vadose zone. For this reason, an interpretation that does not allow for localized and temporary exceptions is clearly unreasonable because it would eliminate *all* legitimate forms of aquifer recharge, well installation and water production, and associated water usage and management.

Thus, an alternative interpretation already exists that recognizes the transient influence of recharge on water quality in the aquifer as a whole, including effects on water quality in the immediate area of recharge, and their potential impacts on human and/or ecological receptors. The scale and location of the surface infiltration facilities under the proposed Plan mandates ongoing water quality impacts. These

C-22 A similar argument can be made for the heap leach pads and tailings facilities. Even though the footprint will not be expanded, both the heap height and the length of time the liner is in operation will be extended, thus increasing the probability that there will be a leak. Therefore, approval of this project increases the chance that leaks and groundwater degradation will occur. The SEIS should, therefore, treat groundwater degradation from both the heap and tailings as a potentially significant impact.

C-23 The pits will fill with groundwater after the cessation of dewatering. As shown in Table 4.4.4, the water resulting after 100 years for most of the scenarios (various permutations of pit lake number and size) will not be usable without substantial treatment. Fluoride, arsenic and TDS will exceed primary drinking water standards; sulfate exceeds secondary standards, and mercury and silver will exceed ambient standards. The SEIS claims that evapoconcentration is the primary contributory to poor water quality. The evaporation, as discussed above, also is a waste of water and not a beneficial use.

C-24 The pit lake will draw from the groundwater about 100,000 acre-feet of water to fill the pit lake. Because of the water quality impacts just listed, this water will effectively become unavailable for public (or even avian) use. Cortez must show that it has water rights for this use, which is essentially consumptive. It should also show that the use is beneficial. The BLM cannot permit a project that will cause a pit lake to form without assuring that the water rights are available for a beneficial use of water.

C-25 The SEIS concludes that (??) sulfate concentrations will exceed secondary standards. This suggests that sulfide is present, and that the model relies on assumptions to assure that there will not be periods of acidic waters. Interestingly, at the Cove Mine, there was a significant difference between the model predictions and the water quality that in fact occurred. Predictions at Cove were for sulfate concentrations to range near 300 mg/l. Instead, however, concentrations exceeded 1000 mg/l. One potential problem is the rate of reaction used in the model. Even if the acid neutralizing potential far exceeds the acid generating potential of the rock (as suggested on page 4-190), if the neutralizing reactions occur slower than the generating reactions, there will be a period of acidity in the pit lakes (or in the seepage through the waste rock). This could also occur if the water encounters neutralizing rock before it encounters acid generating rock. The kinetic testing (SEIS, page 1-197) does not adequately handle these reaction rate issues either; this is because the initial flush of acid could have passed before the samples were gathered or been diluted or neutralized by subsequent leaching of neutralizing material. The BLM should examine the model at Cove to determine what went wrong and apply that knowledge to the modeling at Pipeline because it appears that there is substantial sulfide available for oxidation at Pipeline, as it turned out there also was at Cove.

C-26 Pit lake models have never been verified in the field. However, the document makes one statement that sounds like an attempt at verification. "The predictions for the Proposed Action and alternatives at 20 years after mining ceases, agree well with water quality monitored in the Cortez pit lake after 20 years (Geomega 2003a)." (SEIS, page 4-202). This implies that Geomega modeled the Cortez pit lake. Alternatively, it implies that expected pit lake quality at Pipeline is similar to that at Cortez. If indeed the models treat

Data have identified only potential transitory exceedances of numerical water quality standards for non-toxic constituents in the recharge zone. The comprehensive ground water monitoring program that is already in place will provide a practical assessment of potential degradation and impacts under the more realistic long-term interpretation, which allows water quality criteria to be applied in a more reasonable context.

C-21

See responses to Comments C-19 and C-20.

C-22

Heap leach pads and tailings facilities are not similar to infiltration basins. Process facilities are lined to keep process solutions and product contained. Infiltration basins are designed to infiltrate clean water back into the aquifer.

The existing permitted heap leach and tailings facilities are required to be constructed and operated consistent with NAC 445A, which requires that there are no permitted discharges of process solutions. Should a leak occur at either facility, CGM would be required by NDEP to assess the leak and take all necessary measures to correct the malfunction of the facility in an effort to prevent degradation of waters of the state.

C-23

Evapoconcentration is the primary mechanism by which pit lake concentrations increase, as solutes present in baseline ground water concentrate over time. However, pit lake water quality will not be poor compared to other water bodies in Nevada. The pit water will meet all standards for beneficial usage with the possible exception of drinking water in the distant future.

The ambient water quality criteria for mercury and silver are not regulatory standards, but are published comparative benchmarks. Predicted concentrations above these benchmarks do not indicate a risk to ecological receptors, and ERAs evaluating water quality conclude that future pit lake concentrations will not pose a risk to local wildlife communities (Geomega 2004b). The text in Section 4.10 has been revised to incorporate the results of the ERA. Also see response to Comment C-15.

C-24

The pit lake water will be of sufficiently good quality for all public and avian use with the possible exception of drinking water in the distant future. The pit lake could be used for a drinking water supply upon use of standard water treatment technology (e.g., water softeners, etc.). The State of Nevada can adjudicate that water usage in accordance with issued water rights because the pit lake would be available for beneficial use.

C-25

The premise of this comment “that predicted sulfate concentrations in excess of the secondary drinking water standard for sulfate indicate there is *substantial sulfide available for oxidation at Pipeline*” is erroneous. The presence of sulfate at the Pipeline Mine is not indicative of sulfide oxidation. Rather, evapoconcentration of ambient ground water and leaching of sulfate minerals are the primary factors controlling predicted sulfate concentrations in the ultimate Pipeline/South Pipeline pit lake(s). Hence, the low sulfide lithology associated with the Pipeline Mine is substantially different from the lithology and geochemistry of the Cove Mine.

Sulfide analyses were conducted on 80 samples representative of the Pipeline/South Pipeline lithologic regime. A majority of the tested samples (50) contained no detectable sulfide (less than 0.1 percent), and only one sample contained greater than one percent sulfide (Geomega 2003d). Furthermore, comparison of sulfate concentrations in the humidity cell effluent and background sulfate concentrations in ambient ground water (Geomega 2003b) clearly indicate that most of the sulfate ultimately residing in the pit lake will come from ambient ground water, rather than from the leaching of sulfate and/or sulfide bearing wall rock material.

Additionally, an analog pit lake test was conducted to verify the model's predictions. The field-scale analog pit lake test results were in agreement with the model's predicted sulfate concentrations (Geomega 2003b).

C-26

There is no reference to the Cortez pit lake on page 4-202 of the Draft SEIS.

Contrary to the comment, sulfidic rocks do not occur in greater abundance in excavated portions of the Cortez open pit than they do in the Pipeline/South Pipeline open pit area. The lithology, climate, and hydrologic regime associated with the former Cortez pit lake are similar to those associated with the prospective Pipeline/South Pipeline Expansion pit lake(s). Hence, the water quality of the pit lake that formed in the Cortez open pit provides a real world check on the model's predictions for the Pipeline/South Pipeline Pit Expansion Project SEIS.

An analog pit lake test was used to assess the water quality resulting from leaching of Pipeline/South Pipeline lithology by site ground water under field conditions (Geomega 2003b). The fact that the analog pit lake test results were in close agreement with the model's predictions demonstrates that the model closely matches a set of field data not used in the calibration process. Thus, the suggestion that the model and/or its components have not been verified because they have not “accurately simulated the reactions in a pit lake” is false.



these lakes similarly, there would be a great reason for concern. There appears to be more sulfidic rock in the Cortez Mountains. BLM should not use the Cortez pit lake to verify the pit lake model for Pipeline unless it presents a model for that pit lake and provides the same details for it as it does for Pipeline.

There are additional issues with validation. The SEIS lists a series of models used for the pitlake model and then states: "Each of the described model components has been validated previously through peer review and applied to similar predictions of post-mine open pit water quality." (SEIS, 4-196). That is an incorrect statement as applied here. The models may accurately simulate the chemical reactions in a laboratory, however, until they have accurately simulated the reactions in a pit lake, **the models have not been validated.**

C-27 For many of the reasons just stated, the pit lake quality at steady state hydrology may not represent the worst or most acidic conditions. Because of variable reaction rates, the oxidation products could leach into the pit lake as it is forming and the neutralizing products could follow. The pit lake could be substantially acidic for a period before being naturally neutralized.

C-28 Mitigation Measure 4.4.3.3.2, which calls for Cortez to perform a risk analysis if it plans to stop at Stage 9, is not sufficient. Cortez may not have much advance notice as to whether it will stop at stage 9 or not. As such, the risk analysis must be accomplished now based on the chemistry predicted for Stage 9.

C-29 There was barely any mention of the potential for through-flow in the pit to degrade groundwater. The critical time will not be when the pit lake has filled and the backfill has saturated, but when it is filling. It is likely that flow through the pit will occur if water levels recover at variable rates around the pit lake. Additionally, even when the pit lake is fully formed, there will likely be differing heads in the aquifers near the pit at different levels. It will be very possible for the lake to be terminal while outflow occurs through one or more layers. This was not addressed in the document.

C-30 Irrigation with dewatering water at the Dean Ranch probably affects the water quality there. Nevada state law appears to exempt standard irrigation projects from some of the groundwater quality regulations. However, this is not a standard irrigation project. It is irrigation that is approved by the approval of this (and previous) environmental documents. For that reason, the BLM must require groundwater quality monitoring at the Dean Ranch.

#### General comments

C-31 If CGM processes ore at the existing Cortez facility (SEIS, 3-1), then it must be added to the project boundaries (SEIS, Figure 1.1.2, page 1-5). Reclamation requirements and bonding for this project should be extended to include the Cortez facility.

#### C-27

As discussed in the response to Comment C-25, the lithologic regime associated with the Pipeline/South Pipeline open pit area contains little to no detectable sulfides (Geomega 2003b). Hence, acidity resulting from sulfide oxidation will not result in the formation of a "substantially acidic" pit lake. The assertion that acidity resulting from oxidation could leach into the pit lake prior to the introduction of neutralizing products is false; ambient ground water in the open pit area has alkalinity concentrations in excess of 250 mg/l (Geomega 2003b), and the resulting neutralization capacity is not dependent on leachate kinetics. Hence, the lack of sulfide material and the existing neutralization capacity of ambient ground water indicate that the pit lake will not be acidic, even for a transitory period.

#### C-28

Maximum surface water concentrations of constituents resulting from the various mining stages and considered alternatives, including Stage 9, were evaluated in an updated ERA (Geomega 2004b), which concluded that the water quality in the Pipeline/South Pipeline open pit is not likely to adversely affect wildlife that could be attracted to the pit lake. Thus, water quality resulting from Stage 9 would not pose an unacceptable ecological risk. Also see response to Comment C-23.

#### C-29

The potential for pit lake throughflow, as determined in the ground water modeling study, was discussed on pages 4-202, 4-208, 4-210, 4-211, 4-213, 4-217, 4-219, and 4-220 of the Draft SEIS. Additional details are provided in Geomega (2003e).

The comment asserts that the "critical time" for throughflow will be while the pit lake is filling due to variable recovery rates in the aquifer surrounding the open pit. Only under rare hydraulic circumstances would it be possible for some localized throughflow to occur during open pit filling, and any such occurrence would be transitory and the associated water would ultimately be recaptured and returned to the pit lake. The ground water modeling study included the transitory period of open pit filling during which heads in the surrounding aquifer recover and establish equilibrium with the pit lake. Thus, the time period of concern mentioned in the comment was part of the overall analysis, and no persistent pattern of potential throughflow was noted except for those conditions already described in the Draft SEIS and supporting documents (Geomega 2003a).

The possibility of throughflow conditions were checked for every layer in the model intersected by the pit lake. Hence, the analysis accounted for the possibility of vertical variability in potential ground water throughflow.



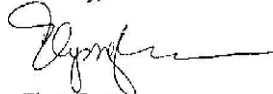
C-32 [ Additionally, the SEIS mentions that some roast ore will be shipped offsite for processing (SEIS, page 4-15). To be complete, the SEIS must analyze the impacts (traffic, air pollution, etc.) of that shipping on the environment.

C-33 [ In the backfilled portion of the pit, the plan must include provisions to assure that sliding of the backfilled material will not occur. The pit lake and groundwater level in the backfill will not likely be stable seasonally or annually due to changing infiltration and climate change. It is essential that the design include provisions to prevent sliding.

C-34 [ The SEIS specifies that the plan will mine 110 million tons of ore and 590 million tons of waste rock, but also that it could vary dependent on economic conditions. Is this the maximum or could economic conditions dictate more mining as a result of this provision? The SEIS must be based on the maximum amount that could be removed as part of this approval.

Thank you for considering our comments.

Sincerely,



Elyssa Rosen  
Executive Director

Enclosed:  
Pipeline Complaint to NDEP  
Technical Memorandum re Pipeline Reinfiltration Project Groundwater Contamination

C-30

The BLM's approval of the Plan and issuance of the ROD are not approvals of irrigation, but include approvals of conveyance of water across public lands to private lands. The agricultural activities that are conducted by CGM at the Dean Ranch are a separate legal land use that has the appropriate approvals from the Nevada State Engineer for the use of ground water in agricultural irrigation.

C-31

The Cortez facility is a separate operation that has a current Plan and reclamation bond. This facility is currently authorized to process ore and the Proposed Action would only deliver ore to this currently permitted facility.

C-32

The transportation on public roads associated with the Proposed Action is a continuation of the existing activities. Text has been added to the Section 2.6.8 to outline the extent of the current transportation associated with the Project. The Proposed Action only extends the time over which these uses of the public roads will occur.

C-33

The text in Section 3.1.3 of the Final SEIS has been revised to address this comment.

C-34

If CGM plans to mine additional ore and waste than outlined in the Proposed Action and previous approvals, then the Plan would need to be modified.

## WESTERN MINING ACTION PROJECT

*Roger Flynn, Esq.,  
Jeffrey C. Parsons, Esq.*  
2260 Baseline Rd., Suite 101A  
Boulder, CO 80302  
(303) 473-9618  
Fax (303) 786-8054  
wmap@igc.org

*Nicole U. Rinke, Esq.*  
505 South Arlington Ave., Suite 110  
Reno, NV 89509  
(775) 337-2977  
Fax (775) 337-2980  
nevadamining@sbcglobal.net

July 13, 2004

Hand Delivered

Allen Biaggi, Interim Director  
Nevada Division of Environmental Protection  
333 W. Nye Lane, Room 138  
Carson City, NV 89706-0851

**RE: Complaint and Request for Investigation – Pipeline Infiltration Project**

Dear Mr. Biaggi,

On behalf of Great Basin Mine Watch (GBMW) and the Western Shoshone Defense Project (WSDP), Western Mining Action Project hereby files this complaint and request for investigation regarding the Pipeline infiltration Project (PIP) at the Pipeline Mine. The Pipeline Mine, operated by Cortez Joint Venture, is located in Crescent Valley, approximately thirty-five miles southeast of Battle Mountain in Lander County. The Mine extends below the water table and, thus, in order to maintain access to the ore, requires the ongoing removal of groundwater that would otherwise flow into the open pit. The removed water is pumped to several infiltration sites, via which the water is returned to the sub-surface. See NDEP Fact Sheet, NEV95111 (Renewal) (2001).

The PIP is governed by WPC Permit NEV95111. The Nevada Division of Environmental Protection (NDEP)'s Bureau of Mining Regulation and Reclamation

(BMRR) most recently renewed the permit on August 28, 2001. The renewed permit, unless otherwise modified or revoked, will be in effect until September 11, 2006.

The PIP, as currently permitted, includes ten infiltration sites comprised of fifty-five infiltration basins and associated wells. The permit allows Cortez to discharge up to 30,067 gallons per minute (gpm). In 2003, Cortez pumped a total of 1.1 billion gallons of water from below the ground, approximately seventy percent of which was discharged to the infiltration sites. See Myers Report (attached), at 1.

Cortez's use of the PIP is likely to expand and continue as the Bureau of Land Management just recently, on June 14, 2004, released the Draft Environmental Supplemental Impact Statement for expansion of the Pipeline Mine. See BLM, Pipeline/South Pipeline Pit Expansion, Draft Environmental Supplemental Impact Statement (May, 2004). The expansion would allow Cortez to extend the depth of the pit, thus, increasing the need for future dewatering and continued use of the PIP. Id. Already, even absent the expansion, Cortez's average annual discharge of water to the PIP has increased from 4,000 gpm to 24,000 gpm. See NDEP Fact Sheet, NEV95111 (Renewal) (2001).

Because of the ongoing groundwater contamination and the likely future contamination caused by the PIP, GBMW and the WSDP now file this complaint and request for investigation. The attached technical report prepared by Dr. Tom Myers (hereinafter "Myers Report") details the contamination.<sup>1</sup> In brief, the report explains that the infiltration basins at the PIP are leaching salts and nitrates that are present in the

---

<sup>1</sup> Dr. Tom Myers, the former Executive Director for GBMW, has a PhD in hydrology from the University of Nevada, Reno and extensive experience with mining and mine-related hydrology issues. See Dr. Tom Myers Resume (attached).

shallow soil layers and carrying them into the underlying groundwater. As a result, at many groundwater wells in the area nitrates and TDS levels exceed drinking water standards by more than several times. See Myers Report.

GBMW and the WSDP each raised concerns regarding groundwater contamination as a result of the PIP in comments to NDEP regarding the draft permit renewal in 2001.<sup>2</sup> GBMW chose not to appeal NDEP's renewal of the PIP at that time because it was believed that further recharge at the existing infiltration basins would not increase the already existing degradation. See September 13, 2001 letter to NDEP from GBMW. However, data that have been collected since 2001 indicate that in fact the degradation is continuing and, in some cases, increasing. See Myers Report. Again, with the impending proposal to expand the Pipeline pit, the concern for ongoing and future contamination persists.

The degradation of groundwater the PIP is causing patently violates Nevada's strict prohibition against groundwater contamination. NRS 445A.490 provides, in part, that "no permit may be issued which authorizes any discharge or injection of fluids through a well into any waters of the state . . . which would result in the degradation of existing or potential underground sources of drinking water."

This strict statutory mandate is reiterated in Nevada's regulations. NAC 445A.424(1) provides, in part, that "[a] facility, regardless of size or type, may not degrade the waters of the state to the extent that . . . (b) for ground water: (1) the Quality is lowered below a state or federal regulation prescribing standards for drinking water." Groundwater, in turn, is defined as "all subsurface water comprising the zones of

---

<sup>2</sup> This complaint incorporates by reference any and all comments GBMW and the WSDP have previously submitted to NDEP regarding the PIP.

saturation, including perched zones of saturation, which could produce usable water.”

NAC 445A.361. Nevada’s regulations further provide that ““degrade”” means to alter the physical or chemical properties of or to cause a change in the concentration of any substance in the waters of the state in violation of the standards established pursuant to NAC 445A.424.”

Nevada’s primary drinking water standard for nitrates is 10 milligrams per liter (mg/l). NAC 445A.453 (adopting, in part, 40 CFR § 141.62). In groundwater wells at the PIP, nitrate levels reach as high as 200 mg/l. See Myers Report. According to the United States Environmental Protection Agency (EPA), high levels of nitrates in drinking water have been found to cause serious illness and death, particularly in children. What happens is that the body automatically converts nitrates to nitrites, which interfere with the oxygen-carrying capacity of blood. Over the long-term, nitrates may also cause duresis, increased starchy deposits, and hemorrhaging of the spleen.<sup>3</sup> Thus, the elevated levels of nitrates present in groundwater as a result of the PIP clearly violate Nevada’s prohibition against groundwater contamination.

In contrast to nitrates, Nevada does not have a primary drinking water standard for total dissolved solids (TDS), or salts. However, it recognizes a secondary standard of 1,000 mg/l for TDS. NAC 445A.455(2). Notably, EPA’s secondary standard for TDS is 500 mg/l. 40 CFR 143.3. In groundwater wells at the PIP, TDS levels far exceed both of these standards, reaching as high as 5,000 mg/l. See Myers Report.

According to EPA, elevated levels of TDS above 500 mg/l affect the taste of water and the water’s corrosive and scaling properties, making it significantly less

---

<sup>3</sup> See EPA, Consumer Fact Sheet on Nitrates/Nitrites (visited July 6, 2004) [http://www.epa.gov/safewater/contaminants/dw\\_contamfs/nitrates.html](http://www.epa.gov/safewater/contaminants/dw_contamfs/nitrates.html).

desirable as drinking water.<sup>4</sup> In addition, according to the United States Geological Survey, water is considered highly saline if it contains more than 10,000 ppm of dissolved salts, moderately saline if it contains more than 3,000 ppm, and fresh only if it contains less than 1,000 ppm of salt.<sup>5</sup> In some regions of the United States, slightly saline water is used for tasks like crop irrigation, but saltwater is not fit for human consumption. Humans cannot drink salt water because the kidneys can only make urine that is less salty than salt water. Therefore, to get rid of all the excess salt taken in by drinking salt water, a person would have to urinate more water than it consumed, resulting in death by dehydration.<sup>6</sup>

In a desert state like Nevada, where freshwater is an enormous commodity, allowing a private entity to turn what is otherwise clean, drinkable water into undrinkable saltwater belies common sense and this state's strong policy in favor of protecting and conserving all groundwater within the state. See NRS 534.020 ("All underground waters within the boundaries of the State belong to the public" and "[i]t is the intention of the Legislature, by this chapter, to prevent the waste of underground waters and pollution and contamination thereof").

NDEP's prompt attention to this matter is critical. First, as already explained, Cortez is currently considering expanding the Pipeline pit and, thus, continuing and expanding the use of the PIP. In addition, although the affected groundwater is not currently used for public drinking water supplies, there are several privately owned

---

<sup>4</sup> See EPA, Secondary Drinking Water Regulations (visited July 6, 2004) <http://www.epa.gov/safewater/consumer/2ndstandards.html>.

<sup>5</sup> See USGS, Water Science for Schools - Saline Water (visited July 12, 2004) <http://ga.water.usgs.gov/edu/saline.html>.

<sup>6</sup> See Newton, Ask a Scientist, Oceans and Saltwater (visited July 12, 2004) <http://www.newton.dep.anl.gov/askasci/bio99/bio99416.html>.

domestic drinking water wells currently drawing from the affected aquifer. Several owners of these wells have expressed great concern regarding the future quality of their drinking water as a result of the PIP.

Further, it is reasonable to believe that as Nevada's population increases, so will the amount of water required for consumption. Nevada is the fastest growing state in the nation. Nevada's population increased by 12.2%, from 1,998,257 to 2,241,154 people, between 2000 and 2003.<sup>7</sup> Additionally, as explained by Dr. Myers, the data indicates that the contaminants are likely moving off-site. See Myers Report. Thus, with the passage of time, the range of the affected area will probably also increase. It is NDEP's duty to protect the public interest and to prevent the degradation of existing or potential underground sources of drinking water. See NRS 445A.445. This duty extends to the water that is currently being affected, and the water that will likely be affected, by the PIP.

GBMW is a non-profit member-based organization that works to protect the land, air, people, and water of the Great Basin from the adverse impacts of mining. It has members that live in the area of the PIP that may need to rely upon the affected groundwater for drinking water. WSDP is a non-profit organization that works to protect and advocate for the rights of the Western Shoshone. The Western Shoshone people live in the area of the PIP and likewise may need to rely upon the affected groundwater for drinking water. In addition, the Western Shoshone believe that water is sacred and that all water is interconnected. Accordingly, harm to the earth's water, wherever it occurs,

---

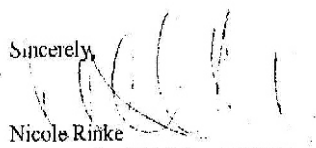
<sup>7</sup> See U.S. Census Bureau, Cumulative Estimates of Population Change for the United States and States, and for Puerto Rico and State Rankings: April 1, 2000 to July 1, 2003 (visited July 13, 2004) <http://csrc.census.gov/popest/data/states/tables/NST-EST2003-02.pdf>.

affects all waters of the earth. The PIP's harm to groundwater, therefore, offends a basic tenant of the Western Shoshone's long-held beliefs.

For the foregoing reasons, GBMW and the WSDP hereby request that NDEP, in response to this complaint, investigate the PIP and the groundwater contamination it is causing. GBMW and the WSDP request that NDEP prepare and submit a report to GBMW and the WSDP regarding its findings and the action it plans to take to: (1) ameliorate the existing contamination; and (2) prevent future contamination from the PIP. Failure to take sufficient action after receiving this complaint may result in future legal action by GBMW and the WSDP to enforce Nevada's strict laws against groundwater contamination.

GBMW and the WSDP thank you in advance for your prompt response and concern regarding this manner. GBMW and the WSDP would be happy to meet with NDEP to further discuss the problems associated with the PIP. If you have any questions or would like to meet with GBMW or the WSDP please contact me at (775) 337.2977.

Sincerely,

  
Nicole Rinke  
Attorney for GBMW and WSDP

Cc: Cortez Joint Venture  
Pipeline Infiltration Project  
HC66 Box 1250  
Crescent Valley, NV 89821-1250



July 12, 2004

To: Great Basin Mine Watch, Western Shoshone Defense Project

From: Tom Myers

Re: Technical Memorandum: Pipeline Infiltration Project Groundwater Contamination

Since the inception of the Pipeline Infiltration Project (PIP) in Crescent Valley, Great Basin Mine Watch (GBMW) and the Western Shoshone Defense Project (WSDP) have frequently documented ongoing water quality violations. The primary concern has been the high concentration of total dissolved solids (TDS) in monitoring wells at and downgradient of the PIP. More recently, high nitrate concentration observations have come to the attention of the groups.

Both groups wrote strong letters regarding the renewal of the water pollution control permit for this project in 2001, but did not appeal the permit. Water quality monitoring data suggest the violations have continued since 2001.

During 2003, Cortez pumped for dewatering 1116.34 million gallons, or 1.1 billion gallons, of water. Cortez uses some of the water for mining and milling or uses it for irrigation at the Dean Ranch. However, Cortez discharged approximately 70.2% of the 2003 dewatering water to the infiltration system. The infiltration system includes rapid infiltration basins (RIB) designed to discharge the dewatering water to the basin fill aquifer. Active sites include Highway, Rocky Pass, Frome and Windmill (Figure 1).

The purpose of this technical memorandum is to document the current state of contamination at the PIP in Crescent Valley and discuss whether it is likely to continue. The memorandum also suggests additional work that should be done to predict whether the contamination will continue and to determine where it may go.

The conclusion is that the PIP has caused and continues to cause TDS and nitrate contamination of area groundwater. Essentially, salts and nitrates in the alluvial aquifer, that were stable between the ground surface and the top of the water table, have been leached by the discharge of the dewatering water to the water table.

#### Methods

Using quarterly and annual monitoring reports provided to the Nevada Division of Environmental Protection (NDEP), I plotted hydrographs of two groundwater quality parameters known to have high concentrations- total dissolved solids (TDS) and nitrates (NO<sub>2</sub> and NO<sub>3</sub> as N) and water levels. I also prepared a table showing all violations up to the year 2003 to show the most recent violations. For TDS, the secondary standard is 1000 mg/l, respectively, and for nitrate the primary standard is 10 mg/l. In this memorandum, these standards are referred to as maximum contaminant levels (MCLs).

A qualitative analysis of trends and water levels is made to explain the contamination and predict whether it will continue.

Many of the monitoring wells have two screen levels, which are usually designated as "s" for shallow and "d" for deep. A memorandum written by Cortez to NDEP<sup>1</sup> was the source for the levels as used in this memorandum.

## Results

**Discharge Water:** The discharge water is pumped from the ground for dewatering and discharged to the RIBs. The water quality is generally good (Figure 2). TDS exceeds the primary standard most quarters, but nitrate concentration, with one exception, is less than 10 mg/l. Since the beginning of 2002, it has been less than 0.1 mg/l. (Figure 2). High TDS and nitrate concentrations observed in monitoring wells around the site apparently result from the act of recharge rather than the discharge water itself.

**Background Water Quality:** Background water quality is difficult to determine at some of the sites because Cortez apparently did not install monitoring wells until it began discharging. The Highway and former Phillipini sites commenced measurement early and have values that appear to be background. For TDS, the observations were about 480 mg/l and for nitrate, the observations ranged from 0.2 to 0.5 mg/l.

**Violations:** For TDS, 393 observations exceeded 1000 mg/l (Table 1) - 84 were between 2000 and 5000, and 36 were between 5000 and 10,000 mg/l. Five of the observations exceeded 10000 mg/l. For nitrate, 310 observations exceeded 10 mg/l (Table 2). 87 of the observations exceeded 100 mg/l, and 5 of them exceeded 250 mg/l.

The remainder of this section is a site-by-site discussion of each well cluster including the data and an analysis of contaminant movement at the site.

<sup>1</sup> Memorandum to Miles Shaw, NV Division of Environmental Protection from Jim Collord, Cortez Joint Venture, dated July 25, 2001. Re: Cortez Joint Venture Pipeline Infiltration Project: Renewal of Water Pollution control Permit NEV95111

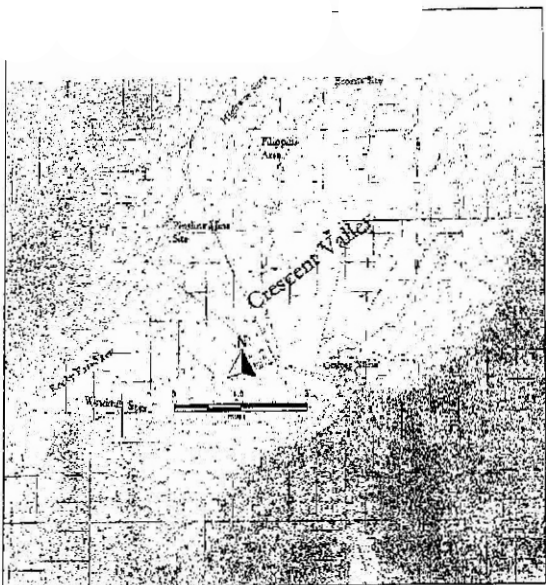


Figure 1: Location of the mine and infiltration sites in Crescent Valley

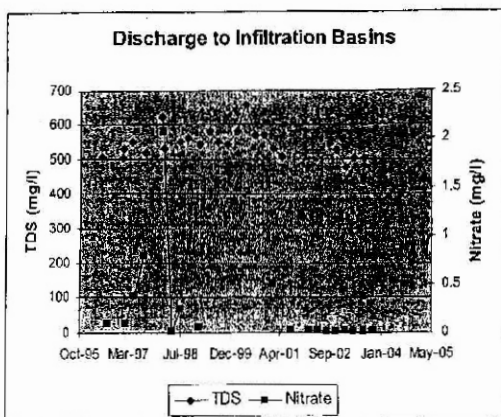


Figure 2: Water quality of water discharged to rapid infiltration basins (RIBs).

## Rocky Pass

Nitrate and TDS concentration observations at Rocky Pass are high and increasing. The nitrate concentration at the deep screen at IM-18, located downgradient of the site (and between it and the Windmill sites), increased from less than 20 mg/l in 1998 to more than 50 mg/l today (Figure 3). In the same well, the TDS concentration first exceeded 1000 mg/l in 2001 and has since continued increasing. Water levels in the shallow and deep IM-18 parallel each other (Figure 4). The shallow screen spans from 38 to 58 feet below ground surface (bgs) and the deep screen spans from 98 to 128 feet bgs. Initially, the nitrate concentration was high in the shallow screen, but has decreased to close to zero. The explanation for that decrease is that vertical flow occurs, leaching the nitrates to deeper levels. Apparently, nitrates and TDS leach and transport at different rates at this site. Indications are that water quality at this well will continue to degrade with continued infiltration.

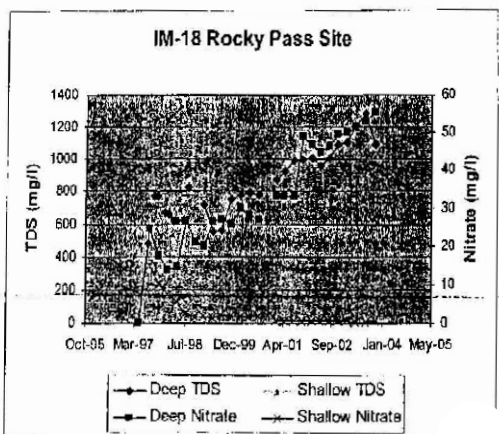


Figure 3: Water quality at well IM-18 at the Rocky Pass site.

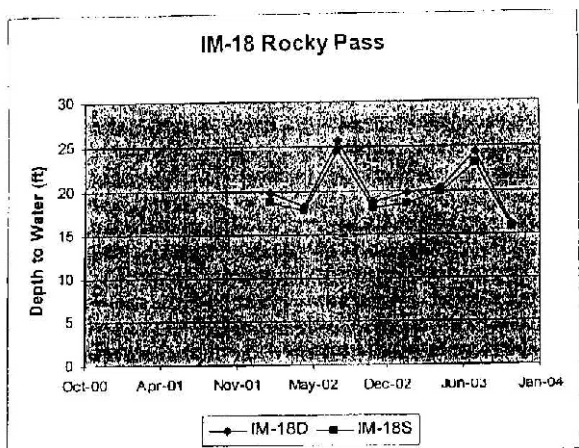


Figure 4: Water level in feet below ground surface for well IM-18 at Rocky Pass.

IM-18 shows the worst water quality at the Rocky Flats site (Figure 3). Well IM-20 is upgradient, screened over the range 137 to 157 feet, and has a depth to groundwater of near 120 feet. Water levels have not apparently been affected by the recharge, therefore well IM-20 has not likely been affected. Infiltration at Rocky Pass apparently moves vertically with ease and may convey leached TDS and nitrate to deeper levels. This could explain the relatively low concentrations observed in the shallow screens at the site.

Cortex built the Rocky Pass II site half a mile south of the Rocky Pass site and further up the valley floor toward the pass. During late 1999 and 2000, both TDS and nitrate concentration observations exceeded MCL at IM-47 d and s, which lie directly under the basin. The concentration observations have since decreased. Depth to water has been increasing from 37 to 51 feet in the deep screen, but there is no data for the shallow screen.

#### Frome Site

Monitoring wells at the Frome site, IM 19 through 27, currently show that groundwater is moderately degraded. The TDS concentration peaked just after the basins were built. Only wells IM-23 and -24 continue to be monitored, therefore, graphs have been prepared for only those wells. At well IM-23 (Figure 5), the TDS concentration has fluctuated between 1000 and 1500 mg/l since 2001 at both the shallow and deep levels. In 1997, the TDS concentration at IM-23 exceeded 2500 mg/l. At the IM-24 well, the TDS concentration at the shallow screen is around 1000 mg/l, but at the deep screen the TDS concentration has trended up to 1500 mg/l (Figure 6). Other wells at the site, IM-26 and IM-27, had TDS concentration peak at greater than 6800 mg/l in February, 1998. TDS concentration decreased in succeeding quarters, but these wells have not been monitored since August 2001. Concentration observations in all but IM-26d dropped

below 1000 mg/l prior to the end of monitoring. Except for a few observations in 1998, the nitrate concentration has been less than 10 mg/l.

Water level fluctuations have differed among wells. At well IM-23, the depth to water was essentially the same at both the deep and shallow screen. However, for IM-24, the levels varied in parallel, but the depth to water in the shallow screen is greater than the depth to water in the deep screen (Figure 7). This indicates there is a gradient directed up at this point, 1/3 mile downgradient from the RIB. The shallow and deeper screen are from 18 to 38 and 58 to 88 feet bgs, respectively. Because the well is downgradient from the RIB, the upward gradient should not prevent seepage. The presence of an aquitard that prevents deep seepage or high vertical anisotropy would explain the gradient. Either would cause rapid lateral movement from the site. The rapid drop in TDS concentration may also be a result of the rapid offsite movement of water.

The concentration peaks occurring just after the commencement of recharge also confirm the likelihood of flows moving offsite. The wells are from 1000 to 2500 feet downgradient from the RIB and flow with high TDS concentrations apparently moves quickly from the RIBs to the monitoring well.

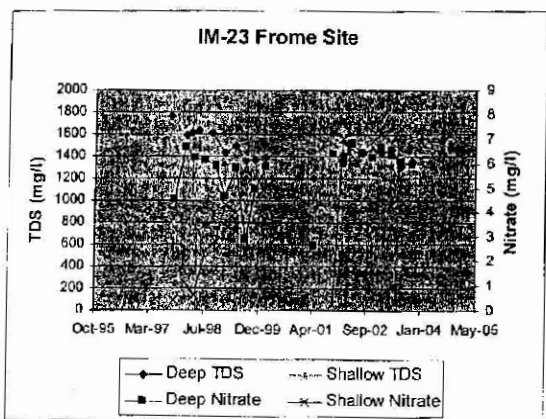


Figure 5: Water quality at well IM-23 Frome site

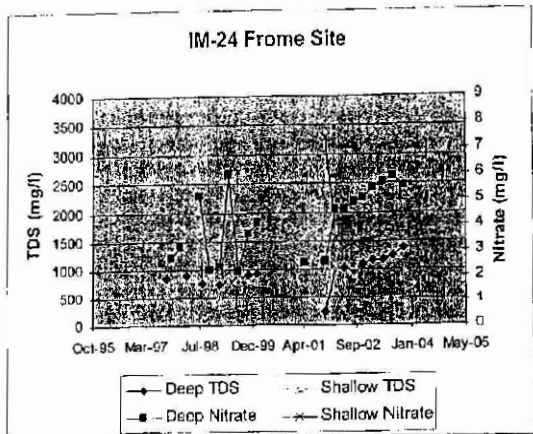


Figure 6: Water quality at IM-24 Frome site

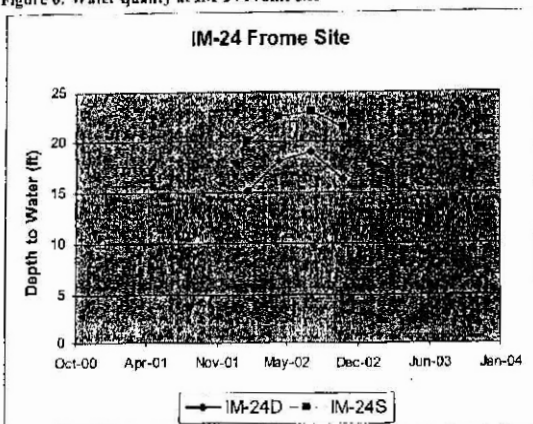


Figure 7: Water levels at IM-24 Frome site

#### Windmill Sites

The Windmill Infiltration site lies from 3 to 4 miles south of the open pit and about a half-mile closer to the pit than the Rocky Pass site. There are four separate clusters of RIBs known as Windmill I, II, IV and V.

Both TDS and nitrate concentrations have and continue to exceed the MCL in wells IM-28 and IM-29 (Figure 8). The TDS concentration in IM-28 trends up. The nitrate concentration in IM-29 trends down. However, even with the downward trend, the nitrate concentration still exceeds MCL by four times and has reached as high as 150 mg/l. At IM-30 d, the TDS concentration exceeded MCL by a little and the nitrate concentration exceeded MCL by four to six times (Figure 9).

Water levels in IM-28, IM-29, IM-30 s and d parallel each other (Figure 10). The water levels at IM-30 s and d are essentially the same indicating that vertical flow occurs. Thus, water flows to deeper levels and the increased TDS concentration at the deep screen indicates that leached salts reach deeper groundwater at this point.

At Windmill II, only the nitrate concentrations at IM-40 and IM-41 have substantially exceeded MCL (Figure 11). These are screened from 68 to 88 feet bgs or at approximately the same level as the deep screens with high nitrate concentrations at Windmill I.

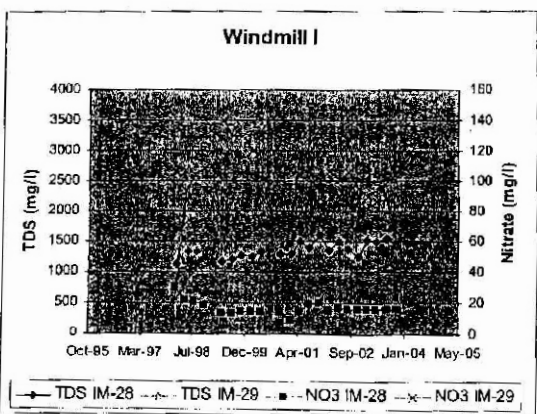


Figure 8: Water quality at Windmill I, IM-28 and IM-29



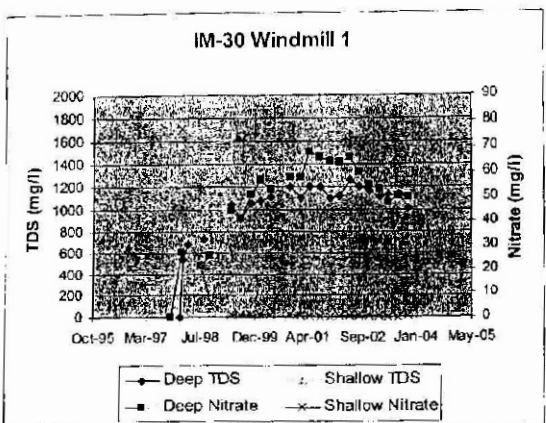


Figure 9: Water quality at IM-30, Windmill I

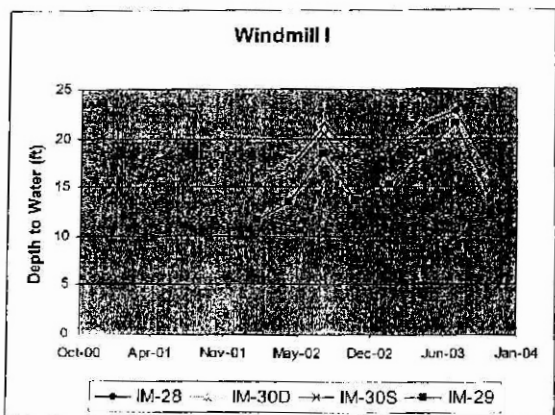


Figure 10: Water levels at Windmill I.

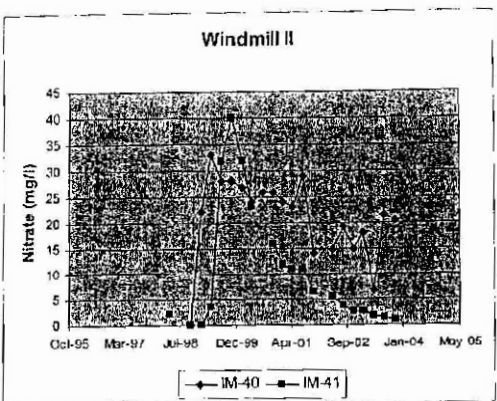


Figure 11: Nitrate levels at Windmill II, IM-40 and 41.

At Windmill IV, there have only been a few exceedences for TDS and none for nitrate. The water level at the site for the well with data, IM-47d, has dropped from about 37 to 51 feet bgs.

Concentration observations in wells at Windmill V previously exceeded MCL for both TDS and nitrate, but most have now trended back into compliance. The exception is IM-51, which lies between Windmill V and Rocky Pass. At IM-51 the nitrate concentration remains more than twenty times MCL at greater than 200 mg/l and TDS remains over 2000 mg/l (Figure 12). The concentration of both TDS and nitrate at the deep screening level is very high. Nitrate and TDS concentration observations have trended down from about 270 to 230 and from 3500 to about 3000 mg/l, respectively, since 1999. Nitrate and TDS currently exceed MCL by 23 and 3 times, respectively. Water levels at this point are about 100 feet higher than the pre-mining level and less than 20 feet below the surface (Figure 13).

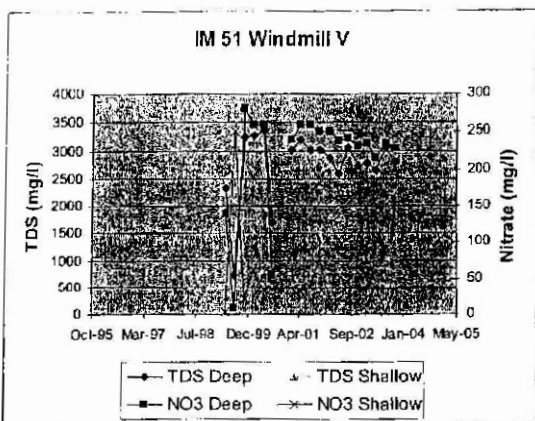


Figure 12: Water quality at IM-51 between Rocky Pass and Windmill V.

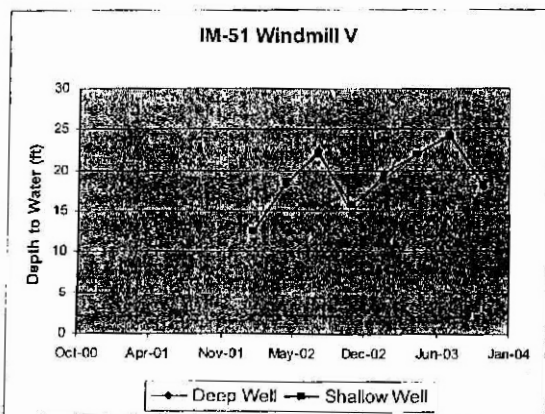


Figure 13: Water levels at IM-51 between Rocky Pass and Windmill V.

#### Highway Infiltration Sites

The TDS concentration at IM-02 has mostly remained steady at values similar to the discharge values and nitrate concentration has mostly remained below 1 mg/l (Figure 14). All of the monitoring wells at the Highway site have maintained water quality better than MCL. The only exception was the TDS concentration reaching 1360 and 2050 mg/l, respectively, at IM-04 in January and April, 1997.

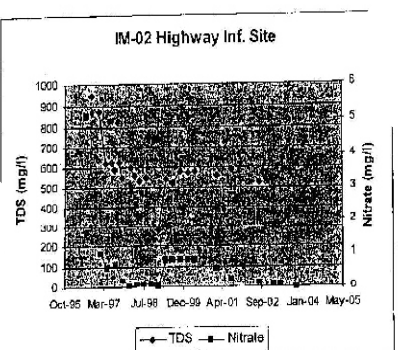


Figure 14: Water quality at IM-02, Highway Site

IM-35 is downgradient about 1/3 mile from the Highway basins. TDS concentration observations in IM-35s exceeded MCL by six times in 1998 but by 2001 had fallen back to less than MCL (Figure 15). There was one violation in 2003. TDS and nitrate concentrations in IM-35d remained low. There is apparently lateral flow at the higher levels, which decreases the concentration of nitrates and TDS. [Unfortunately, there is insufficient water level data to analyze the fluctuation of water level in detail. There is apparently no flow between aquifer layers beneath the Highway Site, which would transport leached solids; the water levels would reveal whether there is an upward gradient.]

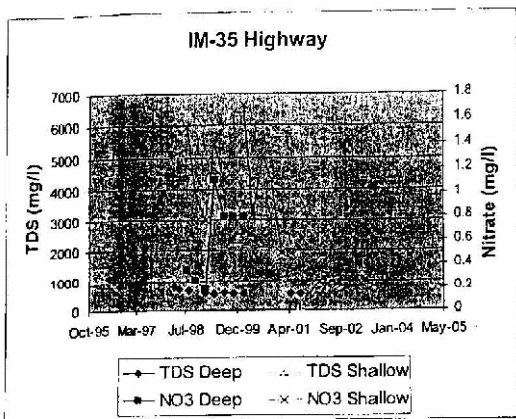


Figure 15: Water quality at IM-35, Highway site

#### Fillipini Site

Discharge at the Fillipini site ceased in 1999 and the site has been reclaimed. Water quality trends at this site are quite interesting. For well IM-15, TDS peaked in 1998 and then dropped, briefly, to less than 1000 mg/l (Figure 16). Since then it has increased every quarter to exceed 5000 mg/l in 2003. The nitrate concentration remained low until the beginning of 2001 when it began steadily increasing to approximately 35 mg/l, or about three times the MCL.

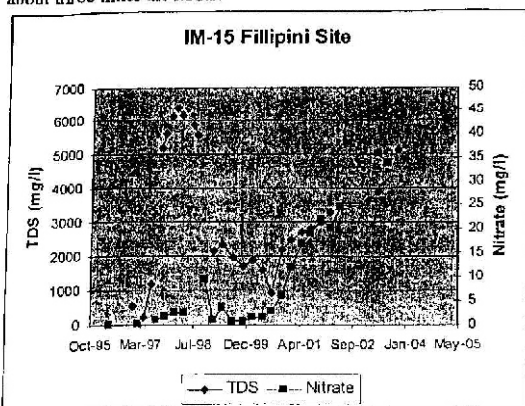


Figure 16: Water quality at IM-15, Fillipini site

IM-10 appears to be upgradient of other wells at the Fillipini site. It is not a good background well, however, because the TDS concentration has trended upwards from 500 to 600 mg/l (Figure 17) and the depth to water has been increasing (Figure 18). Water levels at all the other wells in the area have remained relatively constant. Dewatering drawdown has apparently impacted IM-10 but not the remaining wells.

That the water levels have remained steady even though reinfiltration at the site ended in 1999 suggests one reason that TDS concentrations have remained high. The mound has not dispersed and there's been no additional water added to dilute the water. Cortez claims that from six to twelve pore water volumes are required to completely leach salts and to begin to dilute the receiving water. This does not explain the increase in nitrate concentration, which began two years after reinfiltration ceased.

The wells with high concentrations at Fillipini are directly under the site and clearly indicate a plume. Just east of Fillipini is well IZ-20 and south is IZ-18; neither of these wells appears to be affected by the plume. Unfortunately, there is no data concerning screen levels for these wells. The water level through the site is flat. That the TDS concentration has fluctuated indicates there is flow and contaminant transport. The Highway site about a mile west and upgradient of Fillipini has caused a substantial mound and increased the gradient towards Fillipini. This should cause flow through Fillipini and subsequent movement of contaminants downgradient.

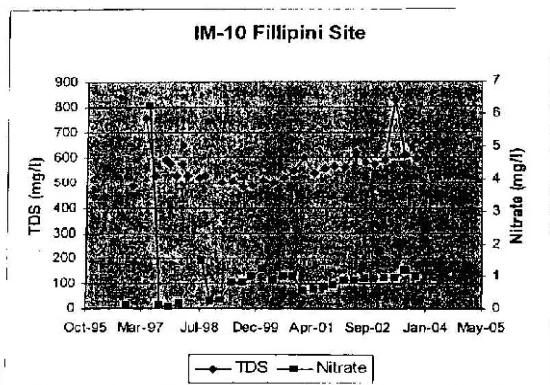


Figure 17: Water quality at IM-10, Fillipini site.

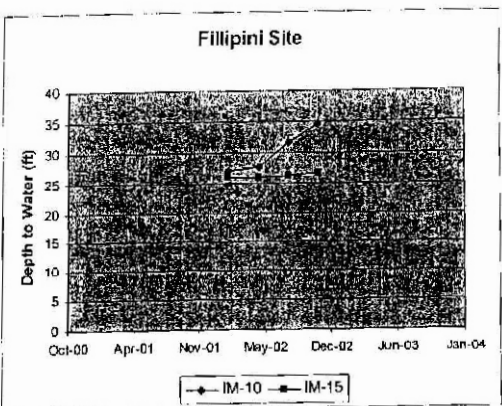


Figure 18: Water levels at the Fillipini site

### Conceptual Model

Cortez discharges dewatering water with relatively good water quality to the RIBs. Observed TDS concentrations range between 500 and 600 mg/l and nitrate concentrations are close to zero. High concentrations found in the monitoring wells are not caused by the quality of water in the dewatering water. High concentrations result from leaching of these constituents from the soils above the screen in the monitoring well. The following conceptual model describes the behavior of flow beneath the RIBs.

The PIP utilizes a series of RIBs for water recharge. A RIB is a pond designed for maximum infiltration through the bottom to recharge dewatering water to the unconfined basin fill aquifer. Water discharged to the RIBs ponds which creates sufficient head (pressure) to cause the water to infiltrate through the bottom of the RIB. The water flows vertically downward until it reaches an impedance such as an aquitard or region with high vertical anisotropy. An aquitard will cause the flow to begin to pond. Ponding increases head on the aquitard, which will increase the gradient through the aquitard thereby increasing flow through the aquitard. Ponding will also cause a horizontal gradient which will drive flow horizontally. The zone of saturation on top of an aquitard is a perched water aquifer. It does not appear that perched zones have formed at Pipeline because there is no evidence of a saturated zone that is separated from an ambient water table.

At the PIP, groundwater mounds have formed on top of the pre-existing water table. As the vertically flowing water reaches the water table, it ponds. This ponding is a groundwater mound. Water in a groundwater mound is clearly groundwater and not vadose zone water. The Handbook of Hydrology defines the vadose zone as "the partially saturated region between the ground surface and the water table."<sup>2</sup> The creation of a mound raises the water table and decreases the thickness of the vadose zone. The mound establishes a gradient which causes flow to move horizontally.

High vertical anisotropy also causes horizontal flow. Vertical anisotropy is the ratio of horizontal conductivity to vertical conductivity. Horizontal conductivity usually exceeds vertical conductivity, which means that the media is more conducive to horizontal flow than it is to vertical flow. Beneath the water table, high vertical anisotropy limits mixing of water among layers. When the driving force is vertical, as it is for infiltrating water beneath a RIB, the water still flows vertically but also disperses horizontally. Ultimately, then, the footprint of water reaching the water table is larger than the area of the RIB. If several basins adjoin each other, it is possible that there will be overlap among basins, which will increase horizontal flow away from the entire site and the size of the footprint of the entire site. The horizontal flow advection increases the soil volume from which salt and nitrate may be leached.

<sup>2</sup> Smith, L. and S.W. Wheatcraft, 1992. Groundwater Flow. In Maidment, D.R. (editor in chief), 1992. Handbook of Hydrology. McGraw-Hill, New York.



Flow through previously unsaturated soil will leach both TDS and nitrate from that soil. A recent study<sup>3</sup> published in *Science* indicates that arid soils present a vast reservoir of nitrates that may be leached by significant water flow through the soils. The authors found nitrate concentrations at 2000 mg/l in the zone beneath the root zone. They hypothesize that the rare wet periods cause sufficient water to leach nitrate, along with chlorides, from the surface soil to the subsoil beneath the root zone. The absence of frequent water leaching below the root zone and biologic activity (due to a lack of organic material) stabilizes nitrates and decreases denitrification. Infiltrating water from anthropogenic source, such as the RIBs at the Pipeline Mine, may leach TDS and nitrate from this vast pool.

Thus, water infiltrating from the RIBs either causes perched aquifers or mounds on the water table with poor water quality due to the leaching of salts and nitrates. This would be the case when vertical flow is limited. If vertical mixing occurs, the contaminants mix into the water table. At the PIP, most well screens are only in the mounds, therefore it is impossible to know the impacts on ambient groundwater. However, it is likely that standard diffusion and advection is causing ? would cause the contaminants to spread to a deeper level of the aquifer. As advection occurs, the total mass of contaminants will be spread over a larger volume. By definition, mass/volume, the concentrations will begin to decrease as a result of the advection. However, the area of degradation will have grown.

The conceptual model proposed herein indicates that contaminants are moving offsite. The data presented above also suggests downgradient movement from some of the RIB sites. However, a detailed prediction of where the contaminants are moving and what concentration will exist in the future at specific locations would require a detailed fate and transport model of the entire PIP.

#### Peer-Reviewed Journal Article

Cortez scientists and consultants have published a paper in a peer-reviewed journal concerning the design of RIBs at the PIP<sup>4</sup>. . Nothing in the paper demonstrates that degradation has not occurred or is not continuing to occur across the site. Using correlation analysis, the authors concluded that there is a better chance of having high recharge rates at sites with higher depth to ambient ground water and thicker high

<sup>3</sup> Michelle A. Walvourd, Fred M. Phillips, David A. Stonestrom, R. Dave Evans, Peter C. Hartsough, Brent D. Newman, Robert G. Striegl, 2003. A Reservoir of Nitrate Beneath Desert Soils. *Science* 302:1021-24. November 7, 2003.

<sup>4</sup> Fennimore, G.G., A. Davis, L. Goss, and A.W. Warrick, 2001. A rapid screening-level method optimize location of infiltration ponds. *Ground Water* 39(2):230-238. The Cortez memo mentions this paper at least at pages 11 and 22. The page 11 reference is to a WSDP comment that Cortez used "stale science" in its analysis. The National Groundwater Association received the paper December, 1999, accepted it August 2000 and published March, April, 2001.

permeability zones. The correlation included only the Rocky Pass, Frome and Filippini sites, therefore the authors did not even use all of the available data. Because Rocky Pass and Frome performed much better than Filippini and because the depth and soil characteristics also differed substantially among the site, a high correlation was almost guaranteed.

The authors also reported on a successful calibration of the unsaturated flow model HYDRUS-2D to the flow and transport characteristics at the Rocky Pass site. As discussed above, Rocky Pass was a site with few TDS problems. The paper claims that TDS returns to background levels within six months.

The paper does not discuss the problems with high TDS at some of the sites. It does not mention that seepage occurred downgradient from one of the sites or discuss whether the well data being reported on are from the mound or below the ambient groundwater table. In fact, there is a gross error in the paper because it provides a table of water chemistry in the alluvial wells existing before mining commenced. The table purportedly is an average of all the wells shown on a figure of all the monitoring wells. Cortez reported in the memo that most of these wells are screened only in the mound, therefore, it is not possible that these represent pre-mining conditions.

#### Alternative Solutions

GBMW and WSDP have recommended for years that Cortez reinject dewatering water into the bedrock aquifers in a ring around the pit. Because reinjection would eliminate the opportunity for the reinfiltrated water to leach nitrates and salts from the shallow soil layers, this would prevent the degradation that has otherwise been occurring with the RIBs.

There are many examples of reinjection being used for water supply, or to recharge depleted aquifers, to dispose of waste waters. These examples indicate that the technology for reinjection is available and could be used for the disposal or return to the groundwater of water removed to facilitate open pit mining at the Pipeline Mine. In Nevada, it is common for geothermal waters to be reinjected into the aquifer from which they were removed. According to the EPA, there are 53 geothermal electric power wells in Nevada, which require a Class V underground injection control permit. Much of the water removed by coal-bed methane production will be returned to the same aquifer by injection wells. Las Vegas has used injection wells to try and recover the aquifers underlying the city that were depleted during the first half of the 20<sup>th</sup> century. The Ground Water Protection Council has published a bibliography of hundreds of examples of reinjection wells being used around the world. This list can be found at: <http://www.gwpc.org/InjWellBib/Bib01.htm#TABLE%20OF%20CONTENTS>.

#### Summary

Recharge of dewatering water and the subsequent leaching the reinfiltration has caused has degraded groundwater quality for TDS and nitrates at most of the PIP recharge sites.

Many concentration observations since 1996 have exceeded standards. This degradation continues at Rocky Pass, Frome, Windmill I, II, and V and there is no indication that concentrations will soon drop back to standards. The Highway site does not show substantial problems. The Filipini site, which is no longer used, continues to have very high concentrations. Cortez claims that the violations are temporary, but the data suggests otherwise.

Table 1: Table of TDS water quality data (mg/l) by date, well and site. Values in **bold** equal or exceed 1000 mg/l.

Date	Highway Infiltration Site								
	IMW#1	IM-02	IM-03D	IM-03S	IM-04	IM-05D	IM-05S	IM-06	
Jun-96	500		460		468	482		458	
Sep-96	482	948	490		490	488		484	
Dec-96									
Jan-97	455	872	721	893	1380	468	1080	1700	
Apr-97	484	622	840	590	2050	824	662	824	
Jun-97	490	630	590	710	060	880	720	1350	
Jul-97	500	590							
Aug-97									
Sep-97	510	630	820	600	610	730	630	660	
Oct-97	580	550	770	850	730		660	640	
Dec-97									
Dec-97					860	750	610	600	
Jan-98									
Feb-98	520	600	680	620	630	860	640	620	
Apr-98	40	560	660	580	550	730	580	560	
May-98									
May-98	430	530							
Jul-98			590	570	550	630	570	560	
Aug-98	450	560	600	600	570	630	590	590	
Sep-98									
Feb-99	430	280	560	560	530	590	550	570	
May-99		542	550	567	560	570	561	543	
Aug-99		519	551	594	513	538	615	545	
Nov-99		578	578	585	560	530	568	579	
Feb-00		574	551	557	515	525	558	526	
May-00		580	530		546	546	586	530	
Aug-00			610		560	540	570	530	
Nov-00			560		530	530	570	550	
Feb-01		560	550		560	550	580	540	
May-01									
Aug-01		590	560	600	560	540	550	560	
Nov-01						540	530		
Feb-02						510	541		
May-02						523	564		
Aug-02		527				431	514		
Nov-02						476	503		
Feb-03						527	531		
May-03						480	550		
Aug-03						502			
Nov-03						520	546		
Date	Former Fillpini								
	IM-10	IM-11	IM-12	IM-13	IM-14	IM-15	IM-16	I2-18	I2-19
Jun-96									
Sep-96									

21

May-96		720	570	620	670	550	690	490		
May-98									1370	1370
Jul-98										
Aug-98		610	730	830	630	530	820	550		
Sep-98									1050	1160
Feb-99		680	580	720	370	580	660	510	1120	1080
May-99		656	565	553	806	686	646	524	997	1764
Aug-99		649	573	563	803	594	575	511	1048	1841
Nov-99		600	560	756	559	580	566	520	1036	1454
Feb-00		593	578	782	570	565	547	531	1272	1727
May-00		606	569	794	580	555	562	558		
Aug-00		580	570	780	560	540	500	550		
Nov-00										
Feb-01	370	580	570	880	580	560	510	610		
May-01	350	570	540	930	560	580	650	620	1200	980
Aug-01	350	590	560	990	560	600	620	640	1200	850
Nov-01	350			1000	540	580	610	640	1100	
Feb-02	340			1010	540			630	1000	
May-02	356			969	545			647	766	
Aug-02	334			1010	487			586	633	
Nov-02	325			1090	543			615	906	
Feb-03	311			1110	548			585	793	
May-03	350			1210	538			602	745	
Aug-03	381			1280	550			610	1040	
Nov-03	317			1090	512			550	1000	

Date	IM- 23D	IM- 23S	IM24- D	IM- 24S	IM- 25D	IM-25S	IM- 26D	IM- 26S	IM- 27D	IM- 27S
Sep-97	1760	840	870	3670	2060	1960				
Oct-97										
Dec-97							950	1140	1590	1580
Dec-97										
Jan-98					2560	650				
Feb-98	1590	630			2230	640	8360	6900	8200	9740
Apr-98	1610	820	910	2860	1880	800	5080	6500	5080	5240
May-98										
May-98	1630	620								
Jul-98			2000	2040	1790	1830	2000	2040	1790	1830
Aug-98			780	820	1140	2820	1830	1810	1310	1200
Sep-98	1610	1010			1040	1380				
Feb-99	1440	1260	750	520	970	870	1250	1150	910	770
May-99	1492	1289	789	799	1078		1190	1075	727	710
Aug-99	1364	1429	848	883	1011	931	1462	871	620	601
Nov-99	1370		908		875		1241		589	
Feb-00	1383		932		884	890	1346	762	562	
May-00					1000		1100		590	
Aug-00					950		1300			
Nov-00					1200		1300			
Feb-01					1000		1200			
May-01	1200	1500	1100	1100	720	750	1050	590	500	520

Aug-01				690	730		490
Nov-01	1300	1300	240	960			540
Feb-02	1410	1580	1040	1050			523
May-02	1440	1420	1040	1200			570
Aug-02	1440	1280	974	1070			459
Nov-02	1460	1420	1090	919			503
Feb-03	1440	1180	1160	968			510
May-03	1470	1380	1180	884			473
Aug-03	1300	1400	1250	897			486
Nov-03	1350	1150	1380	926			616

Windmill 1 Infiltration Site													
Date	IZ-10	IZ-11	IZ-12	IM-28	IM-29	IM-30D	IM-30S	IM-31D	IM-31S	IM-32D	IM-32S	IM-33D	IM-33S
Feb-98				1130	880	540				560		620	600
Apr-98				1540	910	680	1720	800	800	540	580	600	650
May-98													
May-98				1340	2820			780	750	520	570	640	620
Jul-98													
Aug-98				1330	3340	720	1020			520	580	560	680
Sep-98													
Feb-99								690		510			
May-99				1158	3135	1045	593	641	623	494	520		
Aug-99				1201	3108	913	548	622	585	481	507	631	633
Nov-99				1280	2933	1057	538	623	616	580	521	644	611
Feb-00				1245	2968	1078	534	548	541	465	522	591	590
May-00				1341	3080	1111	552	565	566	607	545	608	632
Aug-00													
Nov-00				1300	2300	1200	600	610	630	480	560	640	650
Feb-01	1700			1300	2300	1100	540	560	560	480	530	580	590
May-01	1700	1500	1300	1500	3200	1200	480	550	550	480	530	520	520
Aug-01	1700	1600	1300	1400	3300	1200	530	550	550	480	540	580	590
Nov-01		860		1600	2300	1100	610			470			
Feb-02		753		1360	2310	1120	532			483			567
May-02		1860		1510	2390	1260	563			492			
Aug-02		1520		1370	717	1200	511			424			
Nov-02		1210		1250	2440	1170	540			484			
Feb-03		1380		1520	1970	1110	535			485			
May-03		1570		1510	2330	1130	532			490			
Aug-03		1380		1550	2520	1140	525			486			
Nov-03		714		1420	1850	1010	501			459			

Date	South Highway			Windmill 1 Infiltration Site									
	IM-34D	IM-35D	IM-35S	IM-36D	IM-36S	IM-37D	IM-37S	IM-38D	IM-39	IM-40	IM-41	IM-42	IM-43
Apr-98	560	780	6220	390	750								
May-98													
May-98	560	700	5090	670	1720								
Jul-98													
Aug-98	1810	670	6320	890	1040				760	430	430	1070	
Sep-98													

Feb-99	680	570	5720	630		700	1000	660	1010	930	380	1040	610
May-99	677	541	3726	600		611	707	571	1078	1325	447		682
Aug-99	654	590	3883	645		593		579	1038	1280	1231	671	623
Nov-99		528		522				640	1068	1233	1566	645	613
Feb-00		546	1485						1046	1163	1597	612	584
May-00			1400						1100	1178	1400		590
Aug-00			2200						1100	1000			580
Nov-00			2100					560	970	1000	1200	610	660
Feb-01			1100						940	950	1100	610	640
May-01	590	530	1200	520		540	550			1000	940	660	640
Aug-01	540	550	110			560	590		868	1010	1000	650	690
Nov-01			640	540						940	780		
Feb-02			975										
May-02			964							902	724		
Aug-02			867							947	738		
Nov-02			664							875	647		
Feb-03			571							889	662		
May-03			1070	571						712	602		
Aug-03			824							949	599		
Nov-03			661	513						891	591		
Rocky Pass II Infiltration													
Windmill IV													
Date	IM-44D	IM-44S	IM-45D	IM-45S	IM-46D	IM-46S	IM-47D	IM-47S	IM-48D	IM-48S	IM-49	IM-50D	
Aug-98	630	1860	680	1170									
Sep-98													
Feb-99	650	580	850	770									
May-99	622	571	801	682							764	2628	
Aug-99	810	534	760	635	796	1276	459	1524			1173	2433	
Nov-99	837	558	719	624	997	955	859	1641			1075	2257	
Feb-00	564	566	650	589	1062	799	1358	1564	531		973	2004	
May-00	810	540	600	570	1072	810	1416	1526	579		915	2062	
Aug-00	1100		580	830	1080	670	1300			620	1200	1600	
Nov-00	660	540	580	580									
Feb-01	630	540	600	570	970	680	1200	900			730	1800	
May-01	610	520				930	660				710	740	
Aug-01	670	590	570	557	810		1200	870	1100		740	1800	
Nov-01				530							570	1500	
Feb-02	589										560	1610	
May-02	570	506		533			863					1270	
Aug-02	583	492		564			836					1330	
Nov-02	576	533		526							447		
Feb-03	608	543		540									
May-03	507	485		510				609				837	
Aug-03	609	527		531			669				567	800	
Nov-03	554	469		495			582				522	783	
Windmill V													
Date	IM-50S	IM-51D	IM-51S	IM-52D	IM-52S	IM-53D	IM-53S	IM-54D	IM-54S	IM-55D			
May-99		2321	640	1299	777			900		2644			
Aug-99	548	728	3267	1097	874	1065	578	2131	685	1863			



Nov-99	557	3243	955	1042	758	881	608	1643	624	1751
Feb-00	594	3267	1510	1009	758	606	560	1208	608	2353
May-00	533	3372	1155	1028	744	560	530	930		2806
Aug-00		1700	1300	790	2900					3200
Nov-00										
Feb-01	510	3000	960	790	740	560	530	680		2600
May-01	550	3200	1100	1000	700	550	550	630	590	2400
Aug-01	570	3000	1200	830	680	540	530	650	530	2200
Nov-01	650	3000	1600							1800
Feb-02	544	2870	909	800	606				544	1500
May-02	541	2590	902	734	567					1170
Aug-02		3060	754	717	622					937
Nov-02		2740	789	652	500					805
Feb-03		672	2780	676	506					742
May-03	503	1300	2670	663	563				448	661
Aug-03	531	644	3070		693					680
Nov-03	553	1270	2800	631	565				520	620

	IM- 55S	IM- 56D	IM- 58S	Dean	Fence	Fence 07S	Wille
Aug-99	570	651	523				
Nov-99		578	468				
Feb-00	3317	578	521				
May-00	650	582	584				
Aug-00	570	600	620				
Nov-00							
Feb-01	520	570	550				
May-01	470	540	520				
Aug-01	480	570	540				
Nov-01	440	520	570				
Feb-02	464	557	516				
May-02		545					
Aug-02		553					
Nov-02	450	585	566				
Feb-03	394	528	483		298	535	
May-03	378	538		457	340	526	447
Aug-03	426	566		402	361	533	504
Nov-03	376	532		402	329	539	525

Table 2: Table of nitrate water quality data (mg/l) by date, well and site. Values in **bold** equal or exceed 10 mg/l.

Highway Infiltration Site								
Date	IM-01	IM-02	IM-03U	IM-03S	IM-04	IM-05D	IM-05S	IM-06
May-96	0.1		0.3		0.1	0.1		0.1
Aug-96	0.1	5.1	0.4		0.1	0.1		0.1
Nov-96								
Feb-97	0.1	1	0.5	0.4	1.9	0.2	0.8	2.6
May-97	5.13	0.59	1.49	0.5	1.33	0.49	0.62	1.09
Aug-97	3.18	0.66	0.44	0.66	0.25	0.9	0.28	0.5
Nov-97		0.2	0.58	0.22	0.34	0.87	0.39	1.22
Feb-98	3.5	0.02	0.32	0.12	0.28	0.41	0.22	1.61
May-98	4.19	0.06						
Aug-98	4.92	0.09	1.62	3.65	0.48	1.45	1.82	1.48
Nov-98		0.08	0.21	0.24	0.07	0.12	0.15	0.06
Feb-99	3.5	0.02	0.4	0.18	0.1	2.41	0.1	0.46
May-99		0.5	0.8	0.8	0.8	0.8	0.8	0.8
Aug-99		0.5	0.8	0.8	0.8	0.8	0.8	0.8
Nov-99		0.5	0.8	0.8	0.8	0.8	0.8	0.8
Feb-00		0.8	0.8	0.8	0.8	0.8	0.8	0.8
May-00		0.8	0.8		2	2	2	0.8
Aug-00			0.9		0.8	1	0.8	0.8
Nov-00			0.9		0.8	0.8	0.8	0.8
Feb-01		0.55	0.5		0.5	0.5	0.5	0.5
May-01								
Aug-01		0.25	0.13	0.35	0.22		0.15	0.09
Nov-01						0.11	0.18	
Feb-02						0.12	0.05	
May-02						0.11	0.18	
Aug-02		0.13				0.1	0.04	
Nov-02						0.1	0.07	
Feb-03		0.06				0.097	0.115	
May-03		0.07				0.09	0.13	
Aug-03						0.1		
Nov-03		0.01				0.06	0.01	

Former Fillipini									
Date	IM-10	IM-11	IM-12	IM-13	IM-14	IM-15	IM-16	IZ-18	IZ-19
May-96									
Aug-96									
Nov-96	0.1	0.1	0.1	0.4	0.2	0.3	1.3		
Feb-97									
May-97	6.28	3.86	0.28	0.92	5.05	1.12	1.86		
Aug-97	0.1	4.01	0.3	0.12	10.5	1.93	6.58		
Nov-97	0.02	7.41	0.67	0.5		2.57	9.07		
Feb-98	0.15	9.07	0.6	0.91	14.1	2.73	14.8		
May-98			0.3	12.3					
Aug-98	1.49	15.6	0.49	20.5	25.2	9.43	9.88		
Nov-98	0.21	4.36	0.84	20.2	46.6	1.14	13		
Feb-99	0.26	4.34	0.02	23.4	46.9	3.81	14.1		
May-99	0.8			20	39	0.8	14		
Aug-99	0.8	5.5	1.7	21	48	0.8	13		
Nov-99	1	6.7	1.3	16	52	1.7	17		
Feb-00	1.2	6.9	1.7	13	57	1.7	24		
May-00	0.9	6.4	1.5	5.5	16	3	5.8		
Aug-00	1	8.6	1.6		65	6	60		
Nov-00	1	6.2	1.5		0.8	12			
Feb-01	0.55	6	0.75			17		0.5	0.5
May-01	0.6	5.8	0.85	1.2	43	19	9.4	0.5	0.5
Aug-01	0.67	6.4	1.1	2	43	22	9.8	0.5	0.19
Nov-01	0.73	6.9	1.2	1.5	30	20	7.9	0.13	0.18
Feb-02	0.88	5.08	1.32			24.5		0.22	0.15
May-02	0.89		1.32					0.15	0.2
Aug-02	0.93				23.1			0.12	0.19
Nov-02	0.92	1.46						0.11	0.18
Feb-03	0.96	8.39	1.55			38.1		0.11	0.16

May-03	0.94	4.59	1.37		23.8		0.12	0.19
Aug-03	1.17		1.71				0.12	0.18
Nov-03	1.01	11.5	1.74		47		0.11	0.17

Date	Rocky Pass			Frome									
	IZ-20	IM-17D	IM-17S	IM-18D	IM-18S	IM-19D	IM-19S	IM-20	IM-21	IM-22	IM-23D	IM-23S	IM-24-D
May-96													
Aug-96													
Nov-96													
Feb-97													
May-97													
Aug-97	4.1	14.3	24.5	14.9	2.02	16	1.24	7.7	17.6				
Nov-97	1.93	4.99	17.5	10.3	17.9	3.19	1.87			4.54	0.43	2.72	
Feb-98	12.4	3.25	13.8	7.41	1.47	4.85	1.78	5.63	5.47	6.89	1.11	3.13	
May-98	10.4	2.6	14.8	5.54	2.26	5.44	2.08	4.57	3.79	6.27	0.62		
Aug-98	2.82	9.39	25.8	2.46	2.9	9.85	4.08	2.44	2.53	6.14	2.11	5.15	
Nov-98	12.3	3.21	21.1	1.93	1.41	8.21	4.22	2.59	3.15	5.93	2.79	2.25	
Feb-99	8.63	1.23	20	1.69	3.02	6.65	4.53	3.2	3.68	4.68	4.36	2.38	
May-99	6.0	0.1	28.8	1.4	4	5.4	5.6	2.7	5.7	5.8	4	6	
Aug-99	5.8	4.1	27	2	3	6.1	5.3	3.2	5.9	2.9		2.2	
Nov-99	5	2.3	26	1.6	4.6	2.1	5.9	3.5	4.9	5		3.7	
Feb-00	4.3	2.2	30	1.8	6.4	1.4	6.5	4.1	5.9	5.9		4.1	
May-00	4.3	1.1	28	1.6	6.1	1.2	7.2						
Aug-00	3.7	1.5	27	1.8	5.5	0.8	6.6						
Nov-00													
Feb-01	1.65	1.15	1.7	33	0.7	5.6	0.4	7					
May-01	1.7	1.35	0.55	33	0.75	2.5	15	6.5	1.4	1.4	2.65	6.7	2.55
Aug-01	7	1.4	0.81	33	0.84	5	3.2	8	2.6	1.6			
Nov-01	3.3			48	0.79	5	2.6	5	3.6		6.4	0.25	2.6
Feb-02	2.85			46.8	0.68			6.21	1.76		6.03	7.03	4.64
May-02	2.86			44.8	0.63			5.45	0.96		6.84	6.31	4.64
Aug-02	2.76			46.6	0.71			5.1	1.4		6.45	5.71	4.88
Nov-02	2.03			48.8	0.72			4.89	1.57		6.23	8.94	5.05
Feb-03	2.44			50	0.68			4.66	0.89		6.69	7.18	5.5
May-03	2.11			51.4	0.49			4.06	0.91		6.37	6.87	5.7
Aug-03	2.88			53	0.46			4.14	2.07		6.09	7.48	5.87
Nov-03	2.98			55.3	0.7			4.17	1.75		5.99	7.75	5.94

Date	Windmill 1 Infiltration Site												
	IM-24S	IM-25D	IM-25S	IM-26D	IM-26S	IM-27D	IM-27S	IZ-10	IZ-11	IZ-12	IM-28	IM-29	IM-30D
Aug-97		11.4	7.24										
Nov-97	7.05			9.98	5.1	5.39							
Feb-98	7.83	21.2	2.18	37.3	30	37.7	29.8				29.8	22.3	May 02 reversed
May-98				16.6	21	18.3	21.7				21.7	93.5	27.5
Aug-98	3.44	6.49	5.81	5.15	6.72	5.81	21.1				21.1	104	21.6
Nov-98		3.55	1.71	3.83	1.95	0.72	18.4				18.4	108	25.6
Feb-99	2.33	2.78	0.82	2.44	1.64	0.88							6.46
May-99	3.2	8.3		4.1	2.5	1.1	13				13	140	44
Aug-99	4.3	8.4	3.5	3.7	2	1.4	13				13	130	41
Nov-99		7.4		5.7			14				14	130	51
Feb-00		7	6.7	6.3	1.8		14				14	120	57
May-00		8.4		3.3			14				14	120	53
Aug-00		2		5.4									0.8
Nov-00		11		5		14					14	69	58
Feb-01		7.2		2.55			2.85				8.5	73	58
May-01	1.5	0.85	1.1	2.35	0.5	0.5	0.5	2.5	2.2	2.1	14	120	88
Aug-01		0.8	1.05				0.5	2.4	1.75		19	120	85
Nov-01	7.4						5.9		1.7		20	130	64
Feb-02	3.52						0.28		1.59		15.4	107	63.9
May-02	3.11						0.19		4.7		16.4	101	66
Aug-02	3.26						4.72		0.18		16	106	60

Nov-02	3.45					0.2	3.02	16	95.2	549	0.44
Feb-03	3.42					0.21	4.2	15.5	90.1	532	0.52
May-03	3.61					0.18	4.41	15.5	86.3	473	0.18
Aug-03	4.39					0.27	4.77	15.9	88.5	505	0.19
Nov-03	4.34					0.33	1.59	15.7	57.7	495	0.37

South Highway											
Date	IM-31D	IM-31S	IM-32D	IM-32S	IM-33D	IM-33S	IM-34D	IM-35D	IM-35S	IM-36D	IM-36S
Aug-97											
Nov-97											
Feb-98	4.59	0.18	0.00	1.21	7.16	5.83					
May-98	4.23	3.80	4.32	0.99	7.21	7.57					
Aug-98			4.02	0.57	7.61	8.34	1.35	0.35	1.54	4.15	
Nov-98	3.25	1.94	3.73	0.66	7.11	7.45		0.25	1	1.32	
Feb-99	2.51		3.21				0.77	0.18	0.77	1.25	
May-99	2.1	1.6	1.2				1.1	1.1	1.4	1.1	
Aug-99	2	0.6	3.4	1.3	4.5	4.1	1.5	0.8	1.1	1.1	
Nov-99	1.7	0.9	3.4	1.6	3.3	3.2		0.8		1	
Feb-00	1.3	1	4.9	1.4	3.2	2.8			1.7		
May-00	1.1	0.6	5.2	1.1	3.4	2.9			0.8		
Aug-00									1.3		
Nov-00	0.9	1.1	4.6	1.4	2.5	2.5			1.1		
Feb-01	0.6	0.6	2.05	0.95	1.05	1			0.5		
May-01	0.165	0.5	1.65	1	0.85	0.95	0.5	0.5	0.5	0.5	
Aug-01	0.28	0.21	1.7	1.8	1.2	1.2	0.09				
Nov-01			1.55						0.14	0.1	
Feb-02			3.04			0.81			0.24		
May-02			3.48						0.22		
Aug-02			3.98						0.22		
Nov-02			3.99						0.19		
Feb-03			3.71						0.197		
May-03			3.51						0.27	0.06	
Aug-03			4.14						0.21		
Nov-03			5.16						0.24	0.04	

Windmill II Infiltration Site									
Date	IM-36D	IM-36S	IM-37D	IM-37S	IM-38D	IM-39	IM-40	IM-41	IM-42
May-98								2.03	
Aug-98	4.15		2.82	12.8	1.36				15
Nov-98	1.92		0.33	1.68	0.6	13	0.08	0.02	20.4
Feb-99	1.25		0.2	0.39	0.48	21.2	22.1	0.04	6.5
May-99	1.1		1.1	1.1		23	32	3.5	4
Aug-99	1.1		1.1		0.8	23	28	32	5.4
Nov-99	1				0.8	22	28	40	4.9
Feb-00						24	27	32	2.6
May-00						21	24	23	4.3
Aug-00						25	26		0.8
Nov-00					0.8	20	28	16	2.3
Feb-01						17	24	14	1.05
May-01	0.5		0.5		0.5	23	23	11	5.4
Aug-01			0.067		0.025	15	29	11	2.1
Nov-01	0.1					14	6.5		4.7
Feb-02									
May-02						14.8	5.52		
Aug-02						19.4	3.9		
Nov-02						15	2.62		
Feb-03						18.2	2.68		
May-03	0.06					6.69	1.7		
Aug-03						21.4	1.31		
Nov-03	0.04					20.5	0.98		

Rocky Pass II Infiltration Site									
Date	IM-44D	IM-44S	IM-45D	IM-45S	IM-46D	IM-46S	IM-47D	IM-48D	IM-49
Nov-98	4.71	0.64	6.7	12.7					

29

## COMMENT LETTER D



## WESTERN SHOSHONE DEFENSE PROJECT

P.O. Box 211308, Crescent Valley, Nevada 89921  
phone: 775-468-0230, fax: 775-468-0237, email:  
wshdp@comcast.net

August 9<sup>th</sup>, 2004

Pam Jarnecke  
Project Manager  
Bureau of Land Management  
Battle Mountain Field Office  
50 Bastian Road  
Battle Mountain, Nevada 89820-1420

Re: Pipeline/South Pipeline Pit Expansion Project, Draft Supplemental Environmental Impact Statement (SEIS)

Dear Ms. Jarnecke:

These are the comments of the WSDP, an organization committed to the protection and preservation of Western Shoshone rights and homelands, concerning the proposed expansions at Cortez Gold's Pipeline Mine in Crescent Valley. This mine expansion project is predicted to degrade groundwater in the future, and current operation of the Pipeline Mine has resulted in continuing degradation of groundwater quality. As Nevada is the most arid state in the nation, we believe that permitting activities which threaten the quantity or quality of this precious resource is bad public policy for the United States and a threat to the long term survival of the Western Shoshone. Despite the importance of this resource, we feel the BLM has done an inadequate job of assessing the current and future impacts of the project. The environmental justice and cumulative impacts of the project as described in the DEIS are incomplete and inaccurate. We feel the DEIS should be redone and resubmitted to the public in order to make up for the inadequacies of analysis.

The Pipeline Mine is located within the external boundaries of the Western Shoshone Nation, as recognized by the U.S. in the legally binding Treaty negotiated between the Shoshone and the United States at Ruby Valley in 1863. This Treaty remains in full force and effect and is recognized within the U.S. Constitution as "the supreme law of the land." The Western Shoshone Nation has never ceded or sold its homelands. Litigation in Federal Court is ongoing with traditional and tribal governments representing the majority of Western Shoshone as plaintiffs. Payment of the controversial Indian Claims Commission monies should not be viewed as the Federal government's final obligation to the Western Shoshone. The ICC process did not address the Treaty obligations of the U.S. and the process offered by the ICC it is widely understood and documented both domestically and internationally to fall far short of the human rights standards protected under international law. The U.S. actions towards the W. Shoshone and its continuing approval of development projects on Western Shoshone homelands has been found to be a violation of international human rights standards, and particularly a violation of the individual and collective rights of the Western Shoshone people. For additional information it is recommended the BLM revisit the Final Report of the Inter-American Commission on Human Rights concerning the Western Shoshone. Copies of this report have been provided to the U.S. State Department, Department of Justice, Department of Interior and are available at our organizations webpage (wshdp.org) as well as the webpage of the Indian Law Resource Center (indianlaw.org).

D-1

See responses to Comments C-19 and C-20.

D-2

See responses to Comments C-19 and C-20.

D-3

Comment noted.

D-4

As required by Executive Order 12898, the potential for environmental justice effects was evaluated in the Draft SEIS in Section 4.9.3 (pages 4-317 through 4-319). Based on the analysis, which was conducted in accordance with EPA's Guidance For Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis (EPA 1998), the Proposed Action and the alternatives are not expected to disproportionately affect any minority or low-income population identified in the study area, including Native Americans.

D-5

The Treaty of Ruby Valley is not within the scope of this SEIS.

## Water issues

D-6 [ As stated above the impacts to both water quantity and water quality remain some of the most significant impacts associated with this project. Both the WSDP and Great Basin Minewatch have raised these issues continually since before the Pipeline Mine was constructed. Groundwater contamination as a result of infiltration facilities and pit lake formation were predicted and requests made to prevent this from happening. Yet since the facility began operating in 1996 there have been continuing violations of ground water quality standards in the groundwater at the southern end of the valley. In addition to contamination from the infiltration facilities, a water quality report from March 2003 revealed WAD cyanide in a monitoring well near the new heap leach pad. There is no discussion of this in the EIS, yet we note that this well was located in the area experiencing subsidence due to the dewatering. We defer to the expertise of Great Basin Minewatch in addressing the inadequacies of analysis and hereby incorporate their comments with ours. As a result of this continuing contamination of groundwater, the WSDP and GBMW have filed a complaint with the Nevada DEP to stop what we believe to be a violation of State water law. The BLM has failed in protecting the public trust by allowing the contamination to continue and has thus allowed "unnecessary and undue degradation" at this mine site.

D-7 [ In the area of water quantity, specifically the impact of mine dewatering on groundwater (and surface) levels, the DEIS fails to provide information on the nature and state of groundwater levels and flows through the bedrock aquifer. All predictions made within this and previous EIS documents indicate that impacts would occur only within several miles of the mine site, yet evidence exists suggesting a connection between pumping at the Pipeline Mine and the subsequent disappearance of the Cortez Pit lake. If this is in fact the case then all previous predictions must be re-evaluated.

D-9 [ Two reports produced by Brown and Caldwell which investigated the disappearing pit lake in 1998 and 1999 are referenced in this EIS. The conclusion of both of these reports was that the groundwater system within the bedrock is poorly understood and additional data collection is necessary to better understand the hydrology of the area. Both reports noted the possibility that groundwater pumping at Pipeline may be the cause of the water level declines at Cortez. Here we are 5 years later and the same old reports are being referenced. Why has the BLM not pursued the recommendations of these reports? There has been extensive exploration drilling around Mt Tenabo and the neighboring Toiyabe Range for the last several years, presumably greatly increasing the understanding of the geology and hydrology of the area, yet we find no reference to this in the EIS. We imagine your response to be that this information will be included in a future EIS on the Pediment Project. If this was to be your response, we reject it as our current understanding is that the NEPA process on the Pediment Mine has been suspended pending submittal of a revised POO which would include Cortez Hills and Pediment. If the dewatering at Pipeline is affecting groundwater in the Cortez and Toiyabe Mountains it needs to be addressed now! Unless of course the BLM is quietly letting Cortez dewater its future mine sites while leading the public to believe that the impacts are limited to the immediate vicinity of the Pipeline Mine.

D-10 [ In the discussion of alternatives, the complete pit backfill is inappropriately titled. Under this alternative a pit lake would remain, with only the original pit backfilled. Unless my understanding of the English language is mistaken, leaving an open pit to fill with water does not constitute a complete pit backfill.

D-6

The alleged violations raised by Western Shoshone Defense Project and Great Basin Mine Watch since 1996 have not been substantiated despite ongoing review by federal and state agencies. In fact, there are no violations of water quality standards in ground water due to infiltration operations or other mine-related activities, with the possible exception of a single monitoring well (IM-13) located at the former Filippini infiltration site which has subsequently been decommissioned, closed, and reclaimed.

There have been spurious, low-level detections of WAD cyanide in monitoring well SH-02AR, which is located hydrologically upgradient of the SAHL and any other potential source. These low-level detections are most likely analytical error because ground water conditions in that well are geochemically reducing, causing the laboratory analytical method to mis-identify reduced nitrogen species (e.g., ammonia) as cyanide.

Water levels in SH-02AR have been consistently around 250 feet below ground surface since its installation in 2002 indicating that the local water table has not been influenced by mine dewatering at this location. Therefore, this well is outside the area of dewatering-induced subsidence as measured, predicted, and reported in the Draft SEIS (Figure 4.3.39).

D-7

See all the responses to Comment Letter C.

D-8

The commentor misconstrued the requirements of 43 CFR 3809 with respect to compliance with state water quality statutes and regulations. Clearly the operator is required by 43 CFR 3809.420(a)(6) and 420(b)(5) to comply with applicable requirements of federal and state environmental statutes and regulations during all phases of operations. However, contrary to the assertions of the commentor, nothing in 43 CFR 3809 either requires or authorizes BLM to supplant the legal decision making process of state regulatory authorities and substitute BLM decisions regarding compliance with state law or the state's delegated authority to implement federal law on the basis of a NEPA analysis and thus make a determination of unnecessary or undue degradation. Also see the response to Comment C-20.

D-9

See response to Comment C-10. There are no indications of water level changes in the northern part of the Toiyabe Range or in the Cortez Mountains outside of the small part of the Cortez Window encompassing the Cortez open pit.

## Environmental Justice

D-11 We feel the discussion of environmental justice is inadequate and fails to recognize the unique relationship Western Shoshone people have with these lands specifically. This unique relationship with the land is the result of thousands of years of continuous occupation and use, a relationship unlike that of the general public to these lands. Thus impacts deemed to be insignificant to the general public can have a far greater impact on the local indigenous people who value and use things differently.

D-12 It is stated in the EIS that no Traditional Cultural Properties(TCP) exist in the project area which is misleading. Portions of Mt Tenabo that exist within the viewshed, watershed, and air basin associated with the project have been tentatively determined to be eligible as a TCP. Previous ethnographic studies have documented historic and current cultural use of areas within the northern Toiyabe range, and it is our opinion that some of these areas could qualify as TCP's under the National Historic Preservation Act. Yet no consultation formal or informal has occurred with the W Shoshone specific to this project, nor has the BLM approached the Dann family (local Western Shoshone community) to inquire how this project may affect traditional uses. Springs located between Mt Tenabo and Bald Mountain are critically important to wildlife harvested by the Western Shoshone. This area is part of the traditional hunting and gathering grounds of the Dann family and is likely used by Shoshone from neighboring communities as well. These points have been raised before and we will continue to raise them until we are satisfied that Shoshone resources within the project area are being protected.

## Cumulative Impacts

D-13 The cumulative impacts portion of the EIS is crippled by the inadequacies previously noted in the EIS and raises more questions than it answers. The future possibility of wind projects and up to 6,113-11,485 acres of land sales is the first mention we have of these future projects. What information does the BLM have to justify their inclusion in the discussion, and where do the numbers regarding land sales come from? Reasonably foreseeable geothermal projects are ignored, despite approved leases for hot waters near Bald Mtn (Grass Valley) and lease requests on hot springs in Crescent Valley. More importantly there is no mention of current legislation in Congress which if passed would dramatically alter the regulatory regime under which the project currently operates. Nevada representative Jim Gibbons has introduced legislation in Congress entitled HR 2869 Northern Nevada Rural Economic and Land Consolidation Act of 2003. If passed, the bill would mandate the sale of over 60,000 acres of land around Placer Dome's Cortez operations, effectively insulating current and future mining projects with private property. If this were to occur, this may conceivably be the last EIS the BLM ever completes for Cortez's operations leaving the future of any mitigation agreements or jurisdiction by the Department of Interior in question. The failure to even mention this in the EIS is wrong.

D-17 The nearly doubling of mining capacity envisioned by this expansion is not adequately discussed in the EIS. At several points in the EIS it is stated that the project will increase mine life, yet under the original Pipeline EIS, we should still be mining Pipeline. This is the second major expansion of this mine within the time originally predicted to be within the life of Pipeline. By accelerating the rate of production, pressure is increased for the development of additional mines such as the Pediment, in order to feed this increased capacity. As Placer Dome expands into the mountainous areas of its claim blocks, more Western Shoshone culturally significant areas will be encountered. Any delay caused by BLM efforts to document and/or protect these areas, may

D-18

D-10

The word "complete" refers to the complete use of all 590 million tons of waste rock mined under the Proposed Action as open pit backfill.

D-11

See response to Comment D-4.

D-12

The Project Area comprises the 39,350 acre area identified on Figure 1.1.2 (page 1-5) and no properties of cultural and religious importance have been identified within that area. Consultation was completed as part of the South Pipeline Project plan review process. The Pipeline/South Pipeline Pit Expansion Project is within the same Project Area as the South Pipeline Project and therefore no additional Consultation was determined necessary by the BLM.

D-13

Refer to the responses to Comments C-1 through C-12 regarding the adequacy of the analysis in the Draft SEIS.

D-14

The discussion on wind energy is based on information presented in the Nevada Wind Power Development Strategic Plan (BLM 2002b). The Project Area has a good wind power classification. The discussion on a Public Land sale under the RFFA portion of the Draft SEIS (Section 5.4.3.6) is generally based on language in Congressional Bill HR2869, which was introduced on June 24, 2003, as well as the information presented to the commentor by Mr. Jim Collord of CGM in a meeting on February 4, 2000 concerning CGM's interest in having certain public lands conveyed to CGM ownership. In addition, the Western Mining Action Project, the attorneys for the Western Shoshone Defense Project, responded to the Final South Pipeline EIS with a comment addressing the potential for a land exchange. Text has been added to Section 5.4.2 discussing potential geothermal projects. In addition, the text under Section 5.5 has been revised to address the potential impacts.

D-15

Section 5.4.3.6 of the Draft SEIS (page 5-13) discusses a potential of a public land sale and states that "[any] future land sale would be subject to congressional requirements in the implementing legislation." Also see the response to D-14.



D-16

Section 5.4.3.6 of the SEIS (page 5-13) discusses RFFA public land sales, including covenants agreed to at the time of the land sale, as well as the requirement to comply with existing regulations. Text has been added to clarify that permit conditions for existing projects that are on lands subject to a land sale would be addressed in the transfer of title documents, subject to applicable laws and regulations. In addition, any land sale would have to comply with NEPA as defined by Congress in the final legislation.

D-17

The Pipeline Project was approved in 1996 and was projected at eight years of mining and/or processing, which would be through 2003. The South Pipeline Project was approved in 2000 and was projected at ten years, which would be 2004 through 2013. The Proposed Action is projected at seven years, which would be 2014 through 2020. See page 2-2 of the Final SEIS that discusses the Project tracking as projected.

D-18

Comment noted.

- D-19 [interfere with the accelerated production rates. According to conversations with several mine employees, Cortez management has told its workers in the past that massive layoffs would result from a successful appeal by WSDP or GBMW. This created fear and tension in the community, conveniently directed towards us. This is a form of economic blackmail which we do not want to hear repeated. We do not desire to see any workers suffer. We would like to see an examination of Cortez's claim blocks in the area, and how this project fits into their vision of future development. This would be a lot more useful for informed public involvement and participation in the NEPA process.

#### Timing and Public Process

- D-20 [ We find it disturbing that the first formal mention of this expansion we received was this DEIS in the mail. Usually the BLM keeps tribal representatives informed with prior notice of upcoming projects. As this EIS was not created over night, why weren't we given prior notice. Interestingly, numerous Federal and State agencies as well as County and local governments were communicated with concerning the preparation of this EIS. Conspicuously absent from this list are any Tribal governments or organizations. What happened to the government to government relationship between the Federal government and the Tribes that we hear so much about? What about that "trust responsibility"? While our organization is listed as one providing input we do not remember being asked about this project. What exactly did we provide and when? We have raised the dewatering issues numerous times formally and informally as it relates to the discussions around the Pediment Project and proposed TCP designations, yet we note that none of those concerns have been recorded or addressed in this document.
- D-21 [
- D-22 [
- D-23 [ The failure of this EIS to live up to the public participation demands of NEPA is further illustrated by the so-called "public meetings" held in Crescent Valley and Battle Mountain. A bunch of people standing around tables to answer questions is not in our opinion a public meeting. We have expressed our dislike of this format in the past because it does not inform the community as a community. Previously the BLM had conducted meetings which began with presentations by the BLM and project proponent and followed by a question and answer period for the public. This provided an opportunity for the public to hear the same presentation and then hear what questions and/or concerns the community members had. It then allowed everyone to hear the same answer, thus informing the public, in a public way. Individual conversations between community members and BLM or Mine staff at the so-called public meetings are not accessible in the same way. Why does the BLM insist on using a process which stifles public discussion and increases individual isolation?
- D-24 [ This concludes our comments on the EIS at this time. A family emergency and a lack of prior notice prevents me from providing additional comments. We look forward to your responses.

Sincerely,  
*May Gibson for Christopher Sewall*  
Christopher Sewall  
staff, WSDP

D-19

The comment does not directly address the information presented in the SEIS. CGM's, as well as other activities in the areas surrounding the Project Area are discussed in the Cumulative Impacts Chapter of the SEIS (pages 5-1 through 5-14 of the Draft SEIS).

D-20

BLM records indicate that public notice was conducted and scoping comments were received from the Western Shoshone Defense Project. Specific activities and correspondence were as follows:

- |          |   |
|----------|---|
| 12/13/01 | "Dear Interested Public" letter mailed. Sent certified (#7099 3400 00025232 4541) to Western Shoshone Defense Project, Carrie Dann.               |
| 12/18/01 | Federal Register Notice of Intent to Prepare an Environmental Impact Statement for the Pipeline/South Pipeline Pit Expansion Project.             |
| 12/18/01 | BLM News Release #2002-01 sent to area newspapers.  |
| 12/19/01 | Elko Daily Free Press and Reno Gazette Journal publish the legal notice from the above referenced BLM news release.                               |
| 12/22/01 | Elko Daily Free press article "BLM plans EIS of South Pipeline Expansion" published in the Business section.                                      |
| 12/27/01 | Certification card #7099 340000025232 4541 signed by James Stroud.  |
| 1/22/02  | BLM receives a fax from Western Shoshone Defense Project with scoping comments on the pit Expansion Project. Letter signed by Christopher Sewall. |

Further, the Draft SEIS listed those agencies and organizations that provided input on the preparation of the Draft SEIS to the BLM. This was not an exhaustive list of all parties contacted or individual commentors. The Draft SEIS also includes a list of the tribal governments, which were sent the Draft SEIS in May 2004.

D-21

There are no Indian trust lands or resources within or near the Project Area. "Trust responsibility" is a legal term which has no bearing on this Proposed Action and is not within the scope of the document. Also see response to Comment D-20.

D-22

Traditional cultural properties relative to the Pediment Project are outside the scope of this document. There are no known TCPs within the Project Area for this SEIS.

D-23

A lead agency must conduct a public meeting/hearing on a draft EIS when required by statute or whenever appropriate, based on criteria set forth in 40 CFR 1506.6(c). The BLM's NEPA Handbook (BLM Handbook H-1790-1) (NEPA Handbook), distinguishes between a public meeting and a public hearing. It states that public meetings should be held to receive comments on the draft EIS. Formal public hearings are required only in specific cases. Public hearings have more stringent requirements for the actual hearing and recording the proceedings. Program-specific guidance for requirements related to public hearings is set forth in BLM 455DM 1. Guidance for conducting public meetings is set forth in the NEPA Handbook, which states that public meetings may be conducted using a variety of formats. The open house format was used by the BLM to facilitate answering questions on the evaluation provided in the Draft SEIS and to encourage one-on-one communications between the public and those environmental resource professionals that prepared the Draft SEIS. The open house format provides more time and a wider forum for the public to express concerns to the agency, and allows agency specialists increased opportunity to exchange ideas with interested individuals.

D-24

Comment noted.

BOISE  
STATE  
UNIVERSITY

RECEIVED  
MAIL ROOM

1910 University Drive Boise, Idaho 83725-1525

2004 AUG -5 P 12:03

phone 208-426-1246

fax 208-426-4373

<http://english.boisestate.edu>

BUREAU OF LAND MANAGEMENT  
BATTLE MOUNTAIN  
FIELD OFFICE

August 3, 2004

**RE: Cortez's Pipeline Expansion Proposal & Groundwater Contamination**

Pam Jarnecke, Environmental Coordinator  
Bureau of Land Management  
Battle Mountain Field Office  
50 Bastian Road  
Battle Mountain, NV 89820

Dear Pam,

As a native Nevadan I am concerned with the current situation with groundwater contamination at Cortez Gold Mines. As a former mining industry employee I understand how important strong environmental regulations are to the industry and to the public. I would like to see that a party who does not have a financial or personal stake in the decision to permit the Pipeline expansion investigates the matter.

I am also concerned about the harm in continually deferring to the needs of the mining company rather than the needs of the environment. Such a practice is now proving detrimental. Case in point is Cortez's need to submit an "emergency" proposal in 1997 to create more dewatering ponds since it was proven that the re-infiltration system was badly flawed. Since these new ponds have been created, the same problems exist: 1) all of the water pumped out of the ground is not returning to the ground 2) water that is returning underground is contaminated. If the addition of new ponds could not solve these problems, then steps need to be taken to ensure excellent water quality, even if it means halting production.

If it is found that Cortez Gold Mines is indeed in violation of current environmental laws and practices concerning dewatering, then permits for the South Pipeline expansion *should not be granted* by the Bureau of Land Management. Such a decision would be in the best interest of the residents of the Crescent Valley area who use the water for crops and individual consumption, the public that uses the area to hunt and fish, and the wildlife who are the most permanent residents of the area.

Thank you for considering my comments.

Sincerely,

Garawyn McGill-Loberg  
Adjunct Faculty-BSU

	ACT	INF	INT	DATE
DM				
ADM				
PAEC	✓			
SS				
RR				
NR				
FI				
FFS				

FILE LIBRARY/TOSS (CIRCLE ONE)

## E-1

The BLM resource specialists and the third party SEIS contractor's resource specialists have independently reviewed all the data and models as part of the NEPA process. In addition, ground water quality analyses are part of ongoing assessments by federal and state regulatory agencies who review mine operating and environmental monitoring data. Identified ground water quality issues are being addressed via water pollution control permits that require monitoring and mitigation measures as necessary.

## E-2

See responses to Comments C-19 and C-20.

## E-3

See responses to Comments C-19 and C-20.

## COMMENT LETTER F

**Lander Economic  
Development Authority**



October 28, 2004

Ms. Pam Jarnecke  
Bureau of Land Management  
50 Bastian Road  
Battle Mountain, Nevada 89820-1420

Dear Ms. Jarnecke:

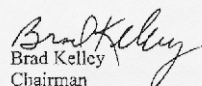
The Lander Economic Development Authority (LEDA) appreciates the opportunity to comment to the Supplemental Draft Environment Impact Statement for the South Pipeline Project. LEDA supports the Proposed Action, which allows for the project to proceed.

LEDA recognizes that the project will provide long term economic benefit to the Battle Mountain area. LEDA desires to work cooperatively with representatives of Cortez Gold to pursue opportunities for maximizing the socio-economic benefits associated with this project and the corporation's presence in Lander County.

LEDA believes that a cooperative approach to enhancing sustainable socio-economic benefits is in the best interest of all. LEDA encourages a sustained working relationship that may provide an opportunity for representatives of Cortez Gold and LEDA to explore the opportunities available for cooperative initiatives.

In economic terms, the project will provide long term benefits to Battle Mountain, Lander County, and the State of Nevada. For all these reasons, LEDA supports the project.

Very truly yours,

  
Brad Kelley  
Chairman

cc File

315 South Humboldt Street ◀ ▶ Battle Mountain NV 89820  
Phone: (775) 635-2860 ◀ ▶ Fax: (775) 635-1120

F-1

This comment letter does not provide any comments on the Draft SEIS.

F-1

## COMMENT LETTER G



KENNY C. GUTIN  
Commissioner

STATE OF NEVADA  
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

### DIVISION OF WILDLIFE

1100 Valley Road  
Reno, Nevada 89512  
(775) 688-1500 • Fax (775) 688-1595

R. MICHAEL TURNIPSEED, P.E.  
Director

Department of Conservation  
and Natural Resources

TERRY R. CRAWFORTH  
Administrator

July 22, 2004

Michael Stafford  
Clearinghouse Coordinator  
Nevada State Clearinghouse  
Department of Administration  
Budget and Planning Division  
209 East Musser Street, Room 200  
Carson City, NV 89701-4298

RE: SAH# E2004-204, Draft Supplemental Environmental Impact Statement, Pipeline/South Pipeline Pit Expansion, Cortez Gold Mine – BLM

Dear Mr. Stafford:

- G-1 [ We appreciate the opportunity to review and provide comments on the subject document. On Page 4-209, under the heading Stage 11, in the second full paragraph, on line 13, the document indicates the South Gap pit will exceed the present ambient water quality criteria. What does this term represent? What are the ambient water quality criteria and who sets them?
- G-2 [ On page 4-215 in the first full paragraph, the document indicates the pit lake is not intended to be used for recreational purposes. We are unsure of this statement. This is contrary to the Department's position on this lake. We believe there will be an excellent opportunity to create a very functional recreation body of water with the pit lakes that remain once this project is mined out. If the concept is accepted up front and designed as part of the backfill construction, this area could be an excellent location for developing a recreation fishery resource for the people of Nevada. A similar effort is presently being developed at another site in Northern Nevada. The Pipeline/South Pipeline project has an even greater potential due to the opportunity to design the pit backfills to facilitate creating a functioning recreational facility following closure. We strongly disagree with what is said in this paragraph.
- G-3 [ On page 4-219, in Section Impact 4.4.3.5.2, the fourth line down states "Development of acidic mine water is predicted." This is contrary to numerous other paragraphs found in this document. We believe this is a typographical error.
- G-4 [ On page 4-320, there is no discussion on the State of Nevada's regulatory role in wildlife management provided in the narrative on Regulatory Framework. In addition, on the same page, in Section 4.10.1.3, Migratory Bird Treaty Act, the document indicates all native birds commonly found in the U.S. are protected under the provisions of the Act except native resident game birds. This is

C:\NDOW\2004\Government Agencies\BLM\act\Mountain P\O\Pipeline\comment\LBIS 0704.doc

G-1

Ambient water quality criteria are the same as aquatic life standards in Nevada as noted in footnote 2 of Table 4.4.4 on page 4-207. The Draft SEIS uses aquatic water quality criteria to be consistent with the Geomega studies and BLM Risk Management Assessment document.

Aquatic water quality criteria listed on Table 4.4.4 were taken from the BLM document Risk Management Criteria for Metals at BLM Mining Sites, Table 5 on page 10. The reference for this document is Technical Note 390 Rev. December 1996. BLM/RS/ST-97/001+1703

The BLM is not aware of any more recent water chemistry benchmarks that are reported by the BLM. The benchmarks reported by the BLM in the above document were largely taken from EPA documents. The BLM believes that the EPA has only updated these numbers in Region IV (for amphibian and reptile exposure). In addition, the BLM believes that the EPA's research group in Cincinnati has generated some new aquatic water quality criteria that account for exposure of wildlife at various times of their development, but these are still in a draft form.

G-2

The intended use of the pit lake is based on the Proposed Action and the BLM's land use plan. CGM has not proposed a recreational use for the pit lake and the analysis of impacts is consistent with CGM's proposal. However, under the Cumulative Impacts Chapter the potential recreational use of the pit lake is discussed and analyzed. The pit lake is not limited for future potential uses with an appropriate analysis.

G-3

The sentence on page 4-219, in Section Impact 4.4.3.5.2, contains a typographic omission. It should read "Development of acidic mine waters is not predicted." This has been corrected in the Final SEIS.

G-4

The text in Sections 4.10.1.1 and 4.10.1.3 has been revised to address this

Michael Stafford  
July 22, 2004  
Page 2

not quite an accurate statement. Mourning doves, waterfowl, swans and geese are considered game birds in Nevada. They are also regulated under the MBTA because they are migratory. The statement should read resident gallinaceous birds.

G-5

On page 5-7, in Section 5.2.3.3 Wildlife Actions, the document describes the past management by the Department of Wildlife. We do not feel this section adequately describes the management programs conducted by the Department in the past. The State has developed programs for game management, fisheries management, habitat management, conservation education, law enforcement, and most recently wildlife diversity.

G-6

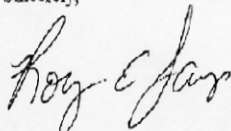
On page 5-9, in Section 5.3.3.3 Wildlife Actions, the document indicates the only planned activities to be conducted by the Department of Wildlife is some water developments. The agency is striving to integrate all areas of our management responsibilities to provide the best opportunity for the residents of Nevada to utilize all of the wildlife resources in Nevada.

G-7

This document does not adequately address the issue of cumulative impacts to wildlife resources in the project area. While there may be no direct or indirect impacts to wildlife resources from the proposed action beyond what has been analyzed in the previous EIS, the cumulative impacts both to the benefit and detriment to wildlife resources have not been adequately described by this document.

If you have any questions regarding these comments, please let me know.

Sincerely,



Rory E. Lamp  
Biologist III  
60 Youth Center Road  
Elko, NV 89801  
(775) 777-2368

RL/vl

cc: Habitat Bureau  
Battle Mountain Field Office  
File

G-5

The types of wildlife projects incorporated in the cumulative impacts chapter are those that have potential impacts similar to those of the Proposed Action, which include surface disturbance and water consumption project. Other wildlife projects, such as habitat enhancement were only included because their potential impacts would not be cumulative with those of the Proposed Action.

G-6

The type of activities discussed relate to how those activities may impact the resources addressed in the cumulative impacts section. The water development activities were the only identified activities with potential impacts.

G-7

The cumulative analysis in a NEPA document is predicated on the Proposed Action having some impact on the resource. If the Proposed Action does not have a direct or indirect impact to a resource, then the proposed action can not have a cumulative impact to that resource and there is no cumulative analysis of that resource.

# COMMENT LETTER H

RECEIVED  
MAIL ROOM

2004 AUG -2 10:51 Humboldt River Basin Water Authority  
P.O. Box 2008  
Carson City, Nevada  
89702  
BUREAU OF LAND MANAGEMENT  
BATTLE MOUNTAIN  
FIELD OFFICE  
Elko County  
Eureka County  
Humboldt County  
Lander County  
Pershing County

	ACT	INF	INT	DATE
DM				
ADM				
PAEC				
SS				
RR				
NR				
FIRE				
TFS				
FILE / LIBRARY / TOBS (CIRCLE ONE)				

July 29, 2004

Ms. Pam Jarnecke  
Project Manager  
Bureau of Land Management  
Battle Mountain Field Office  
50 Bastian Road  
Battle Mountain, Nevada 89820-1420

RE: Comments to Pipeline/South Pipeline Pit Expansion Project Draft Supplemental Environmental Impact Statement

Dear Ms. Jarnecke:

H-1

The Humboldt River Basin Water Authority (HRBWA) considers mining to be an important component to multiple use of public land. The Authority believes that well designed and properly operated mining operations can contribute significantly to rural economies while resulting in environmental impacts which are both anticipated and effectively mitigated. Of particular interest to the Authority is the management of mine de-watered water. HRBWA has held that mine de-watered water should first be managed through re-infiltration into the source basin. If re-infiltration is not practical, the water should be used to substitute for other ground water demands within the source basin. As a last resort, the Authority recognizes that mine de-watered water may need to be discharged into the Humboldt River system.

H-2

With regard to the Pipeline/South Pipeline Pit Expansion Supplemental EIS, HRBWA believes that the BLM has addressed the range of impacts to water resources which may occur as a result of the project. The Authority concurs with proposed management of mine de-watered water by Cortez through re-infiltration into Crescent Valley.

H-3

The SDEIS does however note a small reduction in groundwater flow to the Humboldt River (nine acre-feet). The SDEIS on Page 4-102 concludes that the impact is considered less than significant and no mitigation measures are required. The Authority would encourage BLM to consider that the Humboldt River is a fully decreed system and the nine acre-feet per year do belong to downstream users who will face an unmitigated loss in water availability. Nine acre-feet here and nine acre-feet there represents a potentially significant loss in water availability for users within the Humboldt River.

H-1

Comment noted.

H-2

Comment noted.

H-3

The potential reduction in ground water flow to the Humboldt River noted in the Draft SEIS (nine acre-feet/year) is comparable to or substantially less than the reported precision (0.01 to one cubic foot/second = seven to 700 acre-feet/year) of the USGS's October 19, 1992 discharge measurements for the Humboldt River seepage investigation along the Carlin Trend (Emett et al. 1993). Thus, such a small reduction in flow would not even be discernable. It is beyond the scope of this SEIS to consider the effects of composite losses within the Humboldt River Basin.



Ms. Pam Jarnecke  
 July 29, 2004  
 Page 2

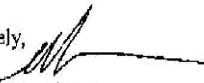
H-4 [ It is not clear that the SDEIS has adequately considered the cumulative impacts of reductions in ground water flow from the proposed project and other projects within the Humboldt Basin.

H-5 [ It is recommended that BLM encourage the project proponents to work with downstream holders of surface water rights in the Humboldt River to seek ways to mitigate the loss of ground water flow to the River. For example, the project proponents might work with the Pershing County Water Conservation District to assist, even in a minor way, with implementation of measures to improve District water delivery systems and to to reduce water loss. Costs for such assistance could be derived from the \$1,250,000 long-term mitigation fund to be established for the project.

H-6 [ Where mitigation would involve provision of a replacement water supply, the Authority would discourage purchase of water rights which result in taking currently productive agricultural lands out of production. Because the Authority considers Nevada surface and groundwater rights to be held in trust by the State of Nevada for the benefit of its residents, any water rights provided by the project proponent as mitigation should be deeded to the State of Nevada and not transferred to the Bureau of Land Management.

Should you have any questions regarding these comments, please do not hesitate to contact me.

Sincerely,

  
 Mike L. Baughman  
 Contract Executive Director  
 (775) 883-2051

H-4

The cumulative effects area for hydrology is Crescent Valley. The SEIS has identified all the known and reasonably substantial uses of the hydrologic resource and incorporated them into the analysis in the cumulative effects analysis. Also see response to Comment H-3 regarding potential impacts beyond Crescent Valley in the Humboldt River Basin.

H-5

The Project does not have a substantive impact to the Pershing County Water Conservation District. Therefore, implementation of mitigation measures as described in the comment are not considered necessary to mitigation of the Project's potential impacts. Also see response to Comment H-3.

H-6

CGM currently negotiates water rights with the Nevada State Engineer and will continue to comply with any future water rights regulations and requirements.



COMMENT LETTER J

Bureau of Land Management  
Battle Mountain Field Office

Pipeline/South Pipeline Pit Expansion Project  
Draft Supplemental Environmental Impact Statement

Comment(s)  
(Please Print)

Name: TAUZE MASON Date: 07/12/04

Organization or Affiliation, if applicable: \_\_\_\_\_

Mailing Address: P.O. Box 211001

City/State/ZIP: Conant Valley NV. 89821

My Comments on the Pipeline/South Pipeline Pit Expansion Project DSEIS are:

County is very responsible in their mining operation.  
We miners are very proud of the operation  
at Conant Gold Mines (Formerly Sand Mines)  
The Expansion of the pit, as the life of  
the mine, will very contribute to the sustainability  
of our community (Conant Valley).  
Without the future development of Conant  
Mines, our town will greatly suffer our community.  
Conant Miners support our community not only  
for an excellent mine, but also we miners are active  
in all functions as Volunteering, Conant Conference,  
Conant County Fair, and other County functions, that  
support the sustainability of our Community.

(Please use additional sheets, if necessary.)

I wish to be added on to the mailing list for this project. ☒ YES ☐ NO

This form must be received by close of business on August 9, 2004 at the Bureau of Land  
Management, Battle Mountain Field Office, to ensure full consideration.

Bureau of Land Management  
Battle Mountain Field Office  
Attn: Pam Jarnecke  
50 Bastion Road  
Battle Mountain, NV 89820  
775-635-4144

J-1

Comment noted.

J-1

# COMMENT LETTER K

Bureau of Land Management  
Battle Mountain Field Office

## Pipeline/South Pipeline Pit Expansion Project Draft Supplemental Environmental Impact Statement

### Comment(s) (Please Print)

Name: Christopher Sewell Date: \_\_\_\_\_  
Organization or Affiliation, if applicable: WSDP  
Mailing Address: P.O. Box 211308  
City/State/ZIP: Crescent Valley, NV 89822

My Comments on the Pipeline/South Pipeline Pit Expansion Project DSEIS are:

K-1

See response to Comment D-23.

K-1

I don't think an open house constitutes a "public meeting." Meetings should be planned to include presentations, followed by comment & question period. In this manner, the public who attend the meeting can hear the same presentation and also hear the questions/answers and concerns raised by community members. We will be submitting additional written comments on the DSEIS-C.

(Please use additional sheets, if necessary.)

I wish to be added on to the mailing list for this project. ☐ YES ☐ NO

This form must be received by close of business on **August 9, 2004** at the Bureau of Land Management, Battle Mountain Field Office, to ensure full consideration.

Bureau of Land Management  
Battle Mountain Field Office  
Attn: Pam Jarnecke  
50 Bastian Road  
Battle Mountain, NV 89820  
775-635-4144

## COMMENT LETTER L

KENNY C. GUINN  
Governor

STATE OF NEVADA

JOHN P. COMEAUX  
Director

RECEIVED  
MAIL ROOM



2004 JUL -9 A 10:39

BUREAU OF LAND MANAGEMENT  
BATTLE MOUNTAIN  
FIELD OFFICE

### DEPARTMENT OF ADMINISTRATION

209 E. Musser Street, Room 200  
Carson City, Nevada 89701-4298  
Fax (775) 684-0260  
(775) 684-0209

	ACT	IN	INT	DATE
DM				
ADM				
P&EC				
SS				
RR				
NR				
FIRE				
TFS				
FILE/LIBRARY/TOSS (CIRCLE ONE)				

July 7, 2004

Pam Jarnecke, Project Manager  
Bureau of Land Management  
50 Bastian Road  
Battle Mountain, Nevada 89820

Re: SAI NV #E2004 -204  
Project: NVN-067575 (01-1a) NV063-EIS01-70 South Pipeline Project

Dear Ms. Jarnecke:

Thank you for the opportunity to review the above referenced project.

L-1

The State Clearinghouse, as per Executive Order 12372, has processed the proposal and has no comment. Your proposal is not in conflict with state plans, goals or objectives. If you have any questions, please contact me at (775) 684-0209.

Sincerely,

Michael J. Stafford  
Nevada State Clearinghouse Coordinator/SPOC

L-1

Comment noted.

COMMENT LETTER M



KENNY C. GUINN  
Governor

STATE OF NEVADA  
DEPARTMENT OF TRANSPORTATION  
1263 S. Stewart Street  
Carson City, Nevada 89712

JEFF FONTAINE, P.E., Director

July 9, 2004

In Reply Refer to:

RECEIVED

PSD 7.01

JUL 19 2004

Mr. Michael Stafford  
Department of Administration  
Budget and Planning  
209 East Musser Street Room 200  
Carson City NV 89701

DEPARTMENT OF ADMINISTRATION  
OFFICE OF THE DIRECTOR  
BUDGET AND PLANNING DIVISION

Dear Mr. Stafford;

I am writing this letter in response to your request for comments on the Pipeline/South Pipeline Pit Expansion Project - Cortez Gold Mines, Inc. (E2004-204).

M-1

The Department requests that a complete transportation analysis be done and included in the final EIS or the SEIS. The study should include projections for the life span of the mine and items or material being transported in or out of the mine site. Both construction and operational phases of the project should be included to ensure that the proper transportation planning can be accomplished.

If you have any questions, please do not hesitate to contact me at (775) 888-7240.

Sincerely,

Kent Cooper  
Assistant Director of Planning

cc: Kevin Lee, District Engineer  
KC: cc

M-1

See response to Comment C-32.

# COMMENT LETTER N

Pam Jarnecke  
USDOI-BLM  
50 Bastian Road  
Battle Mountain, Nevada 89820  
<http://www.nv.blm.gov>

RECEIVED  
MAIL ROOM  
2004 JUL 23 A 11:03  
BUREAU OF LAND MANAGEMENT  
BATTLE MOUNTAIN  
FIELD OFFICE

Thom Seal, P.E., Ph.D.  
P.O. Box 6415  
Elko NV 89802  
July 22, 2004

Public Comment on Draft Environmental Impact Statement (DEIS) for Cortez Gold Mine's Expansion in Crescent Valley Nevada.

I would like to comment on the above DEIS.

## We support Cortez Gold Mine's PROPOSED ACTION.

The proposed action would provide for the environmental sound expansion of the mining at the Crescent Valley mine. The mine offers the rural Nevada population with good paying jobs, which supports a healthy tax base for the US Government, the State of Nevada, and both Elko and Eureka County as well as the local schools.

The BLM must follow the US Congress as established by Public Law 91-631, The Mining and Minerals Policy Act of 1970 which states:

"The Congress declares that it is the continuing policy of the Federal Government in the national interest to foster and encourage private enterprise in (1) the development of economically sound and stable domestic mining, minerals, metal and mineral reclamation industries." 30 U.S.C. 21a.

Domestic production of precious metals is vital to the US balance of trade and is essential to the local economy. The proposed action by Cortez Mine is crucial to the continued economic livelihood of Elko and Eureka County. Any alternative to the proposed action must be based upon "sound science and engineering. The BLM must economically evaluate any alternative to Cortez's proposed action. Great socioeconomic impacts could occur from the BLM adopting any preferred alternative, which is not thoroughly evaluated economically in the DEIS.

Due to the lack of current, sound, scientific socioeconomic data presented by the BLM to support any preferred alternative, and their potential costs, potentially tipping the project to uneconomical, with the loss of jobs, should be rejected. I strongly recommend Cortez's Proposed Action.



Thank You

*Thom Seal*  
Thom Seal, P.E., Ph.D.  
*Jeff Seal*

N-1

Comment noted.

## COMMENT LETTER O

Lang Exploratory Drilling  
A Division of Boart Longyear Company  
3707 Manzanita Lane • Elko, Nevada 89601 USA  
P.O. Box 5279 • Elko, Nevada 89602 USA  
Telephone 775-753-8710  
Fax 775-753-5278

RECEIVED  
MAIL ROOM



2004 JUL 28 A 10:37

### LANG EXPLORATORY DRILLING

BUREAU OF LAND MANAGEMENT  
BATTLE MOUNTAIN  
FIELD OFFICE

	ACT	INF	INT	DAT
DM				
ADM				
PAEC		✓		
SS				
RR				
NR		✓		
FIRE				
TFS				
FILE/LIBRARY/TOSS (CIRCLE ONE)				

Attention South Pipeline SEIS Team  
Battle Mountain District  
Bureau of Land Management  
50 Bastian Road  
Battle Mountain, NV 89820

Dear South Pipeline SEIS Team:

We are writing today to express our strong support for the proposed actions given in the Draft SEIS for the Pipeline/South Pipeline expansion. Our support derives from a number of reasons:

1. The proposed actions occur within the currently approved surface disturbance area. In fact, the proposed actions could be viewed as minor modifications to the current area of disturbance (i.e., higher waste dumps and leach pads, larger open pit areas somewhat offset by backfilling, etc.).
2. Cortez Gold Mines have proven themselves to be good stewards of the land and environment. As such, we do not anticipate adverse environmental impacts as a result of the proposed actions.
3. The economic well-being of Lander, Eureka, and Elko counties is driven largely by the health and vigor of the mining industry. Cortez Gold Mines, like the other mining companies in northeastern Nevada, is a good corporate citizen, and spends a significant amount of money with local businesses. By allowing the proposed actions to be implemented, these rural counties and their residents will benefit enormously.
4. Mining is arguably the best current use of the lands in question.

In light of these observations, Lang Exploratory Drilling strongly supports the proposed actions. We hope that your decision will be to allow Cortez Gold Mines to undertake their expansion plans as they have proposed.

Regards,

Robert M. St. Louis  
Personnel Manager

O-1

Comment noted.



# COMMENT LETTER P

*Vogue*  
LINEN and  
UNIFORM RENTAL

ELKO, NEVADA 89801

RECEIVED  
MAIL ROOM

AUG -3 A 11:17

BATTLE MOUNTAIN FIELD OFFICE

- CELL (775) 738-5156
- 800-659-0732
- FAX (775) 753-5429
- 175 5TH STREET

HIGHEST QUALITY SERVICE

August 2, 2004

TO: Battle Mountain Field Office of the BLM  
50 Bastian Road  
Battle Mountain, NV 89820

RE: Support of Cortez Gold Mines' Proposed Expansion Project.

Dear Sir or Ma'am:

At this time we at Vogue are pleased to extend our support of the Proposed Expansion Project requested by Cortez Gold Mines. Cortez has always been environmentally responsible while mining in Nevada and we appreciate very much the positive effect that they have on our Nevada economy. We welcome the prospect of seven additional years of mining and processing at Cortez and join other supporters in respectfully asking for your consideration and approval of this Proposed Expansion Project. Thank you for your time and consideration of this matter.

Sincerely,

*Joshua L. Park*

Joshua L. Park  
Sales/ Service Manager  
Vogue Linen Supply/ Uniform Rental

cc: Jan Munda, Cortez HR  
Jim Meeks, Vogue Owner

	ACT	INF	INT	DATE
CHA				
ADM				
PAEC	✓			
SS				
HR				
NR	✓			
FIPE				
TRB				
RUE/ LIBRARY/ TOS (CIRCLE ONE)				

P-1

Comment noted.

P-1

# COMMENT LETTER Q



1405 Idaho Street, Elko, NV 89801  
775-778-7135 • 775-738-7136 Fax  
800-428-7143  
chamber@elkonevada.com  
www.elkonevada.com

August 9, 2004

Attn: Pam Jarnecke  
Battle Mountain BLM  
50 Bastian Road  
Battle Mountain, NV 89820  
South Pipeline SEIS

Dear Ms. Jarnecke,

The Elko Area Chamber of Commerce strongly supports Cortez Gold Mines' actions associated with the proposed Pipeline/South Pipeline expansions. The draft SEIS details the facts that all of the expansion is within the approved disturbance footprint and existing state permits for dewatering. The modifications to the existing waste rock and heap leach facility will be indistinguishable after reclamation. Any new waste rock dumps will not be a shift from the current permitted use of the area. Cortez Gold Mines has a laudable record of reclamation and mitigation. The proposed activity in the SEIS will not have a long term impact beyond the existing permitted activity.

Gold mining is a permitted multiple use of BLM managed lands that has positive economic impacts on the economy. These impacts need to be considered in the process. Four communities including Elko benefit from the economic stimulus generated by Cortez Gold Mines. The benefits not only include wages paid by Cortez that are above the national average, but also jobs that are created to supply the mine with goods and materials. These jobs would not exist in this area if Cortez Gold Mines were not in business. Cortez Gold Mines also support the local economy by funding various volunteer and non-profit organizations.

Because of negligible impact of Cortez Gold Mines' proposed activity and because of the positive impacts the activity will have on the local economy, we encourage you approve the SEIS as soon as possible.

Sincerely,

Neil McQueary  
Chief Executive Officer

ADVANTAGE DISTRICT CHAMBER OF COMMERCE, BATTLE MOUNTAIN

Q-1

Q-2

Q-1

Comment noted.

Q-2

Comment noted.

COMMENT LETTER R



7400 Idaho Street, Elko, NV 89801  
775-778-7135 • 775-738-7136 Fax  
800-428-7143  
chamber@elkonvada.com  
www.elkonvada.com

August 9, 2004

South Attn: Pam Jarnecke  
Battle Mountain BLM  
50 Bastian Road  
Battle Mountain, NV 89810  
Pipeline SEIS

Dear Ms. Jarnecke:

R-1 The Elko Area Chamber of Commerce Government Affairs Committee strongly supports Cortez Gold Mines' actions associated with the proposed Pipeline/South Pipeline expansions. The draft SEIS details the facts that all of the expansion is within the approved disturbance footprint and existing state permits for dewatering. The modifications to the existing waste rock and heap leach facility will be indistinguishable after reclamation. Any new waste rock dumps will not be a shift from the current permitted use of the area. Cortez Gold Mines has a tangible record of reclamation and mitigation. The proposed activity in the SEIS will not have a long term impact beyond the existing permitted activity.

R-2 Gold mining is a permitted multiple use of BLM managed lands that has positive economic impacts on the economy. These impacts need to be considered in the process. Four communities including Elko benefit from the economic stimulus generated by Cortez Gold Mines. The benefits not only include wages paid by Cortez that are above the national average, but also jobs that are created to supply the mine with goods and materials. These jobs would not exist in this area if Cortez Gold Mines were not in business. Cortez Gold Mines also support the local economy by funding various volunteer and non-profit organizations.

Because of negligible impact of Cortez Gold Mines' proposed activity and because of the positive impacts the activity will have on the local economy, we encourage you approve the SEIS as soon as possible.

Sincerely,

A handwritten signature in cursive script, appearing to read "Mary Korpi".

Mary Korpi  
Co-Chair Government Affairs Committee

NEVADA'S FIRST CHAMBER OF COMMERCE • EST. 1907

R-1

Comment noted.

R-2

Comment noted.

# COMMENT LETTER S

Broadbent & Associates, Inc.  
2000 Kirman Avenue  
Reno, NV 89502  
Voice (775) 322-7969  
Fax (775) 322-7956

RECEIVED  
MAIL ROOM

2004 AUG 11 AM 10:27

DURHAM COUNTY, NC  
BATTLE MOUNTAIN  
FIELD OFFICE



August 9, 2004

Battle Mountain HLM  
50 Bastian Road  
Battle Mountain, NV 89820

Re: Draft Pipeline/South Pipeline Supplemental Environmental Impact Statement.

I am in favor of the proposed project expansion as outlined within the Draft Pipeline/South Pipeline Supplemental Environmental Impact Statement. Throughout the years of development of the Pipeline project I have been thoroughly impressed with the responsible stewardship of the land that Cortez Gold Mines has exhibited. In my mind, the benefits enjoyed by such a project (i.e. the continued employment of the workforce) when considering the responsible nature Cortez has demonstrated make this project worthwhile.

With specific regard to the heights of various heaps and dumps, my travels in the southern portion of Crescent Valley leave me with the impression that the visual impact of the mine, given the magnitude of the project, are negligible. I understand the proposed expansion includes increasing the height of: the South Area Heap Leach pad by 50 feet; the approved waste rock dump by 50 feet; Area 28 Integrated Heap Leach Tailings by 50 feet; construction of an additional waste rock dump above grade on the backfilled portion of the pit; and construction of the 125-acre Gap waste rock dump. These increased elevations would seem relatively negligible from a visual standpoint, especially considering that the proposed activities will not extend beyond the already approved 7,676 acres.

The Pipeline/South Pipeline expansion appears to me to be a worthwhile project, particularly when considering the economic benefit and the proven track record of responsible stewardship of the land by Cortez.

Sincerely,

Robert H. Miller  
President-Broadbent & Associates, Inc.

	ACT	INF	INT	DATE
DW				
ADM				
PAEC				
SS				
RR				
NR				
PIRE				
YES				
FILE/LEAD/YES (CIRCLE ONE)				

ARIZONA CALIFORNIA NEVADA TEXAS

S-1

Comment noted.

CORTEZ GOLD MINES  
FINAL

PIPELINE/SOUTH PIPELINE PIT EXPANSION PROJECT  
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

## COMMENT LETTER T

SouthPipelineSEIS.doc

MAIL ROOM

2004 AUG 12 A 11:14

9 August 2004

Battle Mountain BLM  
50 Bastian Road  
Battle Mountain, NV 89820

BUREAU OF LAND MANAGEMENT  
BATTLE MOUNTAIN  
FIELD OFFICE

Re: Draft Pipeline/South Pipeline Supplemental Environmental Impact Statement (SEIS)

Dear Sirs,

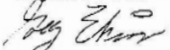
I have been studying land use issues for decades and have earned a Master of Science degree in Land Use Planning from the University of Nevada, Reno. In addition, I am a registered land professional with the American Association of Professional Landman.

I want to encourage the Bureau of Land Management (BLM) to approve the Draft Pipeline/South Pipeline Supplemental Environmental Impact Statement (SEIS).

During the 1990's, employment in the mineral exploration and mining sectors dropped precipitously to unemployment rates as high as 90 percent. I feel this mine in particular is a key to sustaining this modest recovery of natural resource jobs in Nevada. The economic health of the United States is dependent upon the stable supply of natural resources. This stable supply has been diminishing for decades and is now at the point of a small but modest recovery.

Sincerely,

Greg Ekins MS RLP #32306



President, GIS Land Services  
6635 Broadridge Ct.  
Reno, NV 89523  
775-746-8803

	ACT	INF	JNT	DATE
DM				
ADM				
P&EC	✓			
SS				
RR				
NR				
FIRE				
TFS				
FILE/ LIBRARY/TOSS (CIRCLE ONE)				

T-1

Comment noted.

T-1

## COMMENT LETTER U



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION IX  
75 Hawthorne Street  
San Francisco, CA 94105-3901

August 9, 2004

Gerald M. Smith  
Bureau of Land Management  
Battle Mountain Field Office  
50 Eastian Road  
Battle Mountain, NV 89820

Subject: Pipeline/South Pipeline Pit Expansion Project Draft Supplemental  
Environmental Impact Statement (DSEIS) [CEQ #040282]

Dear Mr. Smith:

The U.S. Environmental Protection Agency (EPA) has reviewed the above referenced document. Our review and comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementation Regulations at 40 CFR 1500-1508, and Section 309 of the Clean Air Act.

U-1 [ We have rated this DSEIS as EC-2 – Environmental Concerns-Insufficient Information (see enclosed "Summary of Rating Definitions"). Our concerns are based on potential impacts to pit lake water quality, wildlife, heap leach pad stability in the earth fissure-prone area, and air quality, as well as uncertainties regarding feasible mitigation measures, reclamation bonding, and the long-term contingency fund. We recommend that additional information be provided in the Final Supplemental Environmental Impact Statement (FSEIS) regarding avoidance of significant impacts to pit lake water quality, ecological risk assessment, air quality modeling, hazardous air pollutants, mitigation measures, and details of the long-term contingency fund. We also have suggestions regarding ensuring a stable heap leach pad and storm water diversion channels in the earth fissure-prone area. Our detailed comments are enclosed.

U-2 [ We appreciate the opportunity to review this DSEIS and request a copy of the FSEIS when it is filed with our Washington, D.C. office. If you have any questions, please call me at (415) 972-3854, or have your staff call Jeanne Geselbracht at (415) 972-3853.

Sincerely,

Lisa B. Hanf, Manager  
Federal Activities Office

Printed on Recycled Paper

U-1

See responses to Comments U-3 through U-12.

U-2

See response to Comment C-1.

003844

Enclosures

cc: David Gaskin, NDRP  
Stanley Wiemeyer, U.S. Fish and Wildlife Service

## SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

### ENVIRONMENTAL IMPACT OF THE ACTION

#### *"LO" (Lack of Objections)*

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

#### *"EC" (Environmental Concerns)*

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

#### *"EO" (Environmental Objections)*

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

#### *"EU" (Environmentally Unsatisfactory)*

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

### ADEQUACY OF THE IMPACT STATEMENT

#### *Category 1" (Adequate)*

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

#### *"Category 2" (Insufficient Information)*

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

#### *"Category 3" (Inadequate)*

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

\*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."



Water Resources

U-3 1. The Draft Supplemental Environmental Impact Statement (DSEIS) (pp. 4-214, 215) states that water quality standards applicable to the pit lake would depend on the present and potential beneficial uses of the lake. It concludes, however, that the current beneficial uses would not apply to the pit lake because it is not intended to be a drinking water source for humans or livestock or used for recreational purposes and because Cortez Gold Mines, Inc. (CGM) does not plan to have the pit lake stocked with fish. However, many pit lakes have unintentionally become home to fish and other aquatic species, and there would be no means of restricting terrestrial or avian wildlife from the pit lake. Therefore, the potential impacts to wildlife and aquatic life should not be dismissed at this planning stage of the project. According to the DSEIS, over time, the pit lake would exceed standards for arsenic, silver, mercury, and fluoride, and long-term impacts are potentially significant because solute concentration would continue to increase by evapoconcentration.

**Recommendation:** Based on other pit lakes in Nevada and the western U.S., it appears realistic potential beneficial uses of the pit lake would include propagation of wildlife and aquatic life. Therefore, wildlife and aquatic life standards and ecological risks should be used in determining whether impacts would be significant. The FSEIS should provide this analysis and identify and describe specific measures that may be needed to avoid these impacts. If the reclamation bond or long-term contingency fund should be increased to cover potential mitigation measures, the FSEIS should indicate the amount by which these would be increased.

U-4 2. According to the DSEIS (p. 4-215, 216), if the project terminates at Stage 9, there is a potential for significant long-term impacts to pit lake water quality and terrestrial and avian wildlife. Although the DSEIS states that there appear to be no feasible mitigation measures for these impacts, it also states that the long-term contingency fund would be used for corrective action should the need arise. These statements conflict with one another and, therefore, need clarification.

**Recommendation:** The FSEIS should identify and describe the corrective measures (e.g., backfilling, chemical treatment) that could be taken in the event of a closure at Stage 9 or other stages to reduce the ecological risks of poor quality pit lake water to below the level of significance. The FSEIS should discuss the technical and financial feasibility of all reasonable measures and adjust the reclamation bond amount to cover the cost of such measures. If no feasible measures are likely to exist, this should be clearly stated in the FSEIS, and BLM should reconsider whether the project may pose an unacceptable ecological risk.

U-3

The Draft SEIS evaluated the Proposed Action and uses by CGM. The designation of post-mining beneficial use and applicability of beneficial use requirements for pit lakes would be addressed upon closure of the mining facility. Ecological risk of the Proposed Action by CGM was evaluated in an updated ecological risk assessment (Geomega 2004b), which concluded that water quality in the Pipeline/South Pipeline Expansion pit lake(s) is unlikely to adversely affect wildlife that could be attracted to the pit lake(s). Also see responses to Comment C-23 and Comment G-1.

U-4

Corrective measures to reduce ecological risks of poor quality pit lake water are not needed because water quality resulting from Stage 9 would not pose an unacceptable ecological risk. Maximum surface water concentrations of constituents resulting from the proposed alternatives, including Stage 9, were evaluated in an updated ERA (Geomega 2004b), which concluded that the water quality in the Pipeline/South Pipeline Expansion pit lake(s) is unlikely to adversely affect wildlife that could be attracted to the pit lake(s). The current ERA (Geomega 2004b) used actual data, whereas, the original ERA used one-half of the detection level. Also see responses to Comment C-23, Comment C-28, and Comment G-1. The text in the Final SEIS, Sections 4.4 (Water Quality) and 4.10 (Wildlife) has been modified to reflect the findings in the ERA report.

Based on this information, no significant impact would occur so there would not be a need to discuss increasing the reclamation or long-term bond to cover the impact.

U-5

The Amec report (2004, page 5, Section 3.2 and Figure 7) presents an example of the interpretation of low-sun-angle photography of the site, including the Project facilities in existence at the time the report was submitted June 18, 2003. This fact is clearly stated in the 3<sup>rd</sup> paragraph of page 1 of report (Amec 2003). The introduction also states that the data provided is presented in example form, with additional data pending. As stated by the commentor, Figure 7 depicts the photolineaments in an area removed from the proposed leach pad expansion site and south of the Windmill Fissures. The completed interpretation of the LSA photography is presented as Sheet 5 in Amec's preliminary report (Amec 2003).

Contrary to the commentor's statement, the assessment of risk related to expansion of the leach pad in areas prone to earth fissuring is detailed in the Amec report (Amec 2004). This assessment was the basis for the zoning depicted on Figure 2.3.2 of the Draft SEIS. The evaluation included an exhaustive analysis of available geological and geohydrological data, computer simulations of horizontal ground strain resulting from subsidence, and a field exploration program using seismic refraction profiling and trenching. A comprehensive instrumentation and monitoring program was designed, protective measures were implemented to divert surface water runoff and prevent erosional intrusion by existing fissures, and defensive features were incorporated into the design of the pad expansion.

U-6

The text in Section 2.3.2 of the SEIS describe the measures undertaken by CGM to address the management of the fissures and fissure gullies. These measures incorporate the issues identified in the comment.

Early in the process of responding to the discovery of the Windmill Fissures, CGM completed the construction of a principal diversion channel that now routes runoff from the watershed above the leach pad site to the southwest along the northwestern perimeter of the exiting pad, and the expansion area. This channel is located in an area of low to negligible earth fissure risk. Runoff contributions that previously were managed by the channel running to the south-southeast between the open pit and the expansion area are now captured and diverted to the southwest by the principal channel. In addition to the principal channel, a secondary channel has been constructed near the plant area, directing water to a lined conveyance over the Windmill fissure complex. This secondary structure is designed to manage runoff originating from the small watershed area between the pad expansion area and the diversion channel running south-southeast between the open pit and the expansion area.

### Earth Fissures

- U-5 1. In the referenced June 18, 2003 "Ground Evaluation and Earth Fissure Evaluation Report" the low angle photography analysis is only presented for an area that will not be built on and therefore does not present a threat to the facilities (figure 7). It does not address potential risk for the area that will be built on -- the northeast and southwest sides of the existing heap leach facility. This raises a question as to why the analysis in areas of greater concern was not provided.

**Recommendation:** The FSEIS should provide information on potential risk for the entire expansion area and explain why expansion of the leach pad poses an acceptable risk and the existing fissures will not grow beneath the future liner.

- U-6 2. It appears from the DSEIS that the perimeter of the leach pad is not protected from extreme precipitation events. The upper extension of the storm water diversion channel appears to concentrate runoff from a large area adjacent to the pad without anything to prevent infiltration. The unlined lower storm water diversion channel crosses an area of high fissure risk potential immediately adjacent to the heap leach liner.

**Recommendation:** Because fissure erosion appears to be the highest risk around the heap leach area, we recommend reducing risk by either lining the storm water ditches next to the heap leach pad or moving the major storm water diversion channels away from the heap. This would reduce the risk of earth fissure gully propagation underneath the heap leach pad.

- U-7 3. Figure 2.3.1 of the DSEIS depicts the lower storm water diversion channel in the area of future heap leach pad expansion. There does not appear to be a plan to divert surface water once the heap is fully expanded in areas adjacent to the existing pad.

**Recommendation:** The FSEIS should indicate where the storm water diversion channel will be after the heap leach pad is fully expanded. The associated protective measures must also be included in a description of the future expansion area.

### Air Quality

- U-8 1. According to the 1996 Cortez Pipeline Gold Deposit FEIS (p. 5-38, Table 5.3-3), maximum modeled 24-hour and annual PM<sub>10</sub> (particulates smaller than ten microns) cumulative concentrations for that project were 143.6  $\mu\text{g}/\text{m}^3$  and 34.8  $\mu\text{g}/\text{m}^3$ , respectively. The 24-hour modeled concentration was based on the highest measured value at the Cortez monitoring station before 1996. However, the current DSEIS uses a Nevada Bureau of Air Pollution Control (BAPC) guidance value of 10.2  $\mu\text{g}/\text{m}^3$  for the background concentration, rather than a measured value, which results in the modeled PM<sub>10</sub> 24-hour value of 134  $\mu\text{g}/\text{m}^3$  for this project. In light of the fact that the proposed project would more than double the mining rate at the Pipeline/South

U-7

Section 3.1.5 of the SEIS states that the existing support facilities would be utilized by the Project and would remain in the same condition, unless modified as part of the Proposed Action. The storm water diversion system as described in Chapter 2 of the SEIS is not modified by the Proposed Action. Refer to Figure 2.3.1 for the locations of the storm water diversion system associated with the SAHL.

As noted in the comment, much of the lower storm water diversion channel has been eliminated upon construction of the heap leach pad expansion. Major upland runoff contributions to the expansion area are diverted, utilizing the principal channel that is currently located northwest of the expansion area and the existing pad. The minimal runoff originating from the area between the pad expansion and the upper diversion channel is collected in a channel and routed to the east discharging to the channel running to the south-southeast between the open pit and the expansion area. The minimal runoff originating from the area between the downstream toe of the pad expansion and the plant/pond area is directed to the lined dewatering pipeline corridor. This corridor is designed as a protective component of the earth fissure defensive system, with a full geomembrane-lined channel, and a deep fissure intercept trench between the process ponds and the corridor.

U-8

The BAPC guidance values were used to model the impacts from the Proposed Action and Alternatives because these are the recommended background values for rural facilities by BAPC (see Modeling Guidance document [<http://ndep.nv.gov/bapc/qa/model.html#5>]), the agency with regulatory authority under the Clean Air Act for the facility. The comment refers to actual background being available, but that is not case. As described in the Draft SEIS, air quality monitoring did not begin adjacent to the Pipeline/South Pipeline mine until three years after operations at the site had commenced. Therefore, even the earliest monitoring data includes both regional background PM<sub>10</sub> concentrations as well as impacts from mine operations.

Pipeline mine (from an average of 150,000 tons per day to an average of 350,000 tons per day, with a maximum of 500,000 tons per day) and based on previously modeled emission rates, EPA is concerned that cumulative PM10 emissions could be greater than those modeled for this project. We are concerned that actual project emissions not exceed the PM10 24-hour and annual National Ambient Air Quality Standards (NAAQS), which are 150  $\mu\text{g}/\text{m}^3$  and 50  $\mu\text{g}/\text{m}^3$ , respectively.

**Recommendation:** The FSEIS should describe why BLM used the BAPC guidance value for 24-hour and annual PM10 concentrations when actual values are available for this modeling effort. The most realistic modeling predictions should be provided. The FSEIS should discuss additional mitigation measures that may be needed to reduce PM10 emissions to acceptable levels.

2. The DSEIS does not address projected hazardous air pollutant (HAP) emissions for the proposed project. Mercury is of special concern because it is a persistent bioaccumulative toxic substance, and mercury air emissions over ten pounds must be reported by mining companies in their annual Toxic Release Inventory (TRI) submitted to EPA. Mercury levels in fish above Federal standards for fish consumption have been found in pristine lakes in Wisconsin and remote areas of the Florida Everglades. Studies have revealed this mercury is from atmospheric deposition of mercury emitted thousands of miles away. The Voluntary Mercury Air Emission Reduction Program, a partnership between EPA, the Nevada Division of Environmental Protection (NDEP) and four Nevada gold mining companies, including Placer Dome/Cortez, was launched in 2002. Reduction of mercury emissions at mines is consistent with the Pollution Prevention Act of 1990, which directs Federal agencies to prevent or reduce pollution at the source whenever feasible. By working closely with EPA and NDEP, these mining companies have made process modifications and conducted chemical experimentation, which have resulted in significant, permanent reductions in mercury air emissions at their mines. By 2005 we anticipate a 50% reduction from the levels of mercury emissions reported in 1999. In its 2002 TRI, CGM Mill 2 reported 1355.7 pounds of mercury air emissions. As a result of this voluntary program, CGM should have the information requested readily available.

**Recommendation:** The FSEIS should provide emissions projections for mercury and other HAPs at the existing and proposed Pipeline/South Pipeline Mine and associated operations such as the Gold Acres and Cortez Mine sites where gold processing will also occur. The FSEIS should identify all sources of HAPs at the mine, and discuss how HAPs would be controlled to reduce their emissions as much as possible. The FSEIS should describe the measures/technologies that CGM has taken to reduce mercury emissions at the mine and related mill sites.

3. The DSEIS (p. 4-239-240) discusses the status of the eight-hour ozone National Ambient Air Quality Standard (NAAQS). For clarification purposes, please note that EPA's final designation rule and implementation rule for the eight-hour NAAQS were published in the

U-9

Most mercury air releases occur during the refining process, as a result of heating the precious metal precipitate, which can release naturally-occurring mercury because of its relatively low boiling point. Refining is not currently occurring at Gold Acres or the Cortez Mill. The text of the SEIS has been modified to include a discussion of HAP emissions from the Proposed Action.

U-10

The publishing of the EPA's eight-hour ozone final rule occurred after the release of the Draft SEIS. The text under Section 4.5.1.1 of the SEIS has been revised to address this comment.

U-9

U-10

Federal Register on April 30, 2004, and are effective June 15, 2004. In addition, EPA intends to revoke the one-hour ozone standard on June 15, 2005.

#### Long-Term Monitoring and Mitigation

1. The DSEIS (p. 4-104) indicates that the \$1,250,000 long-term mitigation and monitoring fund could be used to mitigate post-closure fissure development, as well as monitoring and mitigation of other contingencies of the expanded project. Such contingencies include mitigation of poor pit lake water quality should the project terminate at Stage 9. We note that a commitment for this long-term mitigation fund was originally made for the Cortez Pipeline project in 1996. Since that commitment was made, the South Pipeline project and the proposed Pipeline/South Pipeline Expansion have also included provisions to use this fund for post-closure monitoring and mitigation. However, the amount of the committed funds has not been adjusted along with the expanding projects.

**Recommendation:** The FSEIS should identify the potential costs of contingencies and monitoring for the expanded project, discuss whether and how the long-term fund should be adjusted to cover them, and identify when payments into the fund will begin.

2. The 1996 FEIS for the Pipeline project indicated that Cortez would not need to make annual principal payments into the fund until 2005. Therefore, it is unclear whether the fund has been established yet or whether the terms of the fund have been revised to meet the requirements of 43 CFR 3809.552 and 555. It is also unclear whether the fund is expected to grow, what the real return rate would be, and if it will be sufficient to cover post-closure monitoring and mitigation measures.

**Recommendation:** The FSEIS should describe the terms of the fund and discuss how it meets the requirements of 43 CFR 3809.552 and 555. The discussion should include: (a) requirements for timing of payments into the trust fund; (b) how BLM ensures that the trust fund is bankruptcy remote; (c) acceptable financial instruments (such as those specified in 43 CFR 3809.555); (d) legal structure of the trust for tax purposes; (e) who will pay the taxes on trust earnings and trust fees and expenses; (f) how taxes and trust fees will be paid on the trust if the mining company goes out of business; (g) who will make investment decisions if the operator is no longer viable; (h) the identity of the trust fund beneficiaries; and (i) the identity and corporate structure of the operator with responsibility/liability for financial assurance at this site.

U-11

Payments to the fund will begin in 2005. Although the project has changed from the original Pipeline Project, the monitoring and mitigation issues covered by the long-term trust fund remain the same, i.e., pit lake water chemistry, ground stability issues, etc. The size of the long-term fund is considered adequate for this issue because pit lake water chemistry projections are consistent with or better than the 1996 projections. Similarly, ground stability issues have not fundamentally changed compared to those identified in 1996 (BLM 1996). Additional ground stability discussions can be found on page 4-103 of the Final SEIS.

U-12

Please refer to page 2-22 in this document and page 2-39 in the Cortez Pipeline Gold Deposit Final EIS (BLM 1996a) and Placer Dome Inc. 1996.

This Page Intentionally Left Blank